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FORTY MILLION HEVEAS IN THE PHILIPPINES.

FORECASTING the future is a fascinating employment, and the crude rubber situation is a very tempting field in which to let one's fancy wander. Therefore not to prophesy but just to imagine, suppose England were obliged to put an export duty of 20 cents a pound on her plantation rubber, it would cost the rubber trade of the United States say $25,000,000 a year. Suppose that Holland, having suffered cruelly through the war, also imposed a tariff of 20 cents a pound. It would cost American manufacturers $4,000,000. Moreover, suppose the powers that be at Washington put, say, 5 cents a pound import duty on crude rubber. That would be an added tax of $13,400,000, making a total of $42,400,000.

All of the above are at least supposable. On the other hand, suppose American capital had some five to ten million healthy Para rubber trees coming into bearing in our own territory in and about Mindanao. (There is room for hundreds of millions.) Such rubber would not bear an English, Dutch or American tax, either export or import. It would come to our factories at a market rate of 25 cents a pound less than British and Dutch, or indeed Brazilian rubber.

Or why stop at 10,000,000 trees? $42,000,000 invested in *Hevea* trees would mean 42,000,000 trees just coming into bearing with an increase that would in a very few years make the Southern Islands of the Philippines one of the great rubber plantation sections of the world.

TU CHUNG RUBBER IN AMERICA.

IT has been definitely established that the rubber-producing *Eucommia ulmoides*, the tu chung tree of China, can be readily acclimated in other temperate countries and that it is perfectly hardy in Massachusetts. Whether the product of its bark, leaves and fruit is to be regarded as rubber or gutta percha still remains a moot question. In either case, however, it is valuable, gutta bringing 2½ to 3½ times as much as *Hevea* first crêpe or ribbed smoked sheet in the present market. As a feasible future supply, even though only partial, but grown within the borders of the United States, it may yet rank in importance with guayule, and deserves the attention of practical investigators as to its character, extraction and possible commercial uses. The tree being hardy in Massachusetts, it is reasonable to expect that it will also thrive elsewhere in America where suitable soils occur and the mean annual temperature corresponds to that of its Chinese habitat. Suitable regions are therefore clearly indicated by an isometric map showing the line of 59 degrees Fahrenheit across the United States. Moderately high valleys of the Allegheny, Blue Ridge, Rocky, Cascade and Sierra Nevada foothills suggest themselves as localities where altitude, soil and rainfall are likely to be particularly favorable.

SIXTY MILLION TIRES ANNUALLY AFTER 1920.

IT is not surprising that automobile tire manufacturing has become the principal department of the American rubber industry. Fully 4,000,000 cars are in operation in the United States to-day, a number more than four times the total for the rest of the world, and still the demand for machines keeps well ahead of the 40 per cent average yearly increase of past years. Time alone can tell what effect, if any, the war may have upon this demand, but once prices regain their normal level the result is certain. The proportion of pleasure cars is large, but motor trucks in ever greater numbers are replacing the shortage of horses caused by the war, both in peaceful occupations and warfare itself. Leading automobile men assert that the point of saturation will not be reached until every family having an income over $1,000 owns a car. This means not less than 10,000,000

cars, or two and one-half times the present total. Assuming an average life of five years per machine, an annual replacement of 2,000,000 cars, our present production, will be necessary to maintain 10,000,000 in operation.

Translating this prediction into tires, 10,000,000 cars will average five tires annually, or 50,000,000 in all. The 2,000,000 cars constructed every year will require 8,000,000 tires for original equipment, and as each owner soon buys a spare for quick change on the road 2,000,000 more may be added, making a colossal grand total of 60,000,000 tires and a business amounting to $1,250,000,000 annually.

THE IMPORTANCE OF COST ACCOUNTING.

THE value of the Federal Trade Commission's comprehensive campaign of education in cost accounting can hardly be overestimated. If the expert information, constructive suggestions and proffered cooperation be heeded, the results promise to be epoch-making in the upbuilding of American industry on a more stable basis than hitherto.

Business success at all times depends upon a complete and accurate knowledge of the cost of production and of selling. This is more emphatically true to-day than ever before because of keen competition in our home markets, due to ever-rising prices, and the certainty of even keener competition in the markets of the world after the war. We want a rightful share of the world's trade, particularly that of the western hemisphere; but it must be secured at a profit if it is to be worth the getting, and the manufacturer who does not know his true costs may price his goods foolishly and impair the business of his sound competitors while he ruins his own. The cost of selling, no less important than that of production, is too often almost entirely lost sight of. Every manufacturer must expect to face the low prices due to efficiency, but even the most efficient concern is not always able to meet cut-throat prices based on ignorance.

It is a fact that hundreds of industries are at the present time without adequate information regarding their own affairs, indicating that a large number of executives, however intimate their technical knowledge of manufacturing processes, do not have an intelligent grasp of general business methods. The Federal Trade Commission recognizes that the only basis for any industry is a solid foundation of fact, and that the installation of adequate cost accounting systems will not only insure fairer competition and better prices based on efficiency, but will remove many of the difficulties arising between competitors in business as well as between the government and business. To this end, the initiative has been taken to cooperate with trade associations endeavoring to work out uniform and adequate cost accounting systems for their entire industry. It is not the intention to urge any particular method. Each industry must work out its own plan, but the Commission stands ready to act in an advisory capacity and to approve as the standard system for any particular industry that method of accounting which is found to be adequate and uniformly satisfactory to those concerned. In lending hearty support to this progressive movement the rubber trade will be doing itself and the nation a service.

TRAINING YOUNG MEN FOR EXPORT TRADE.

PERHAPS the greatest need in building up a successful foreign trade in rubber goods, or manufactured articles of any sort, is a staff of representatives who speak the language of the nation to which they are to go; who understand the details of the business they are to represent; and who have had a sound training in economics, finance and commerce, with minds trained to grasp situations quickly and schooled in what might be termed the diplomacy of business. Young and aggressive, though tactful men, are needed; men who will not require so much direction upon assuming their posts as to make them cost more than they are worth.

To meet this need quickly and well, progressive rubber manufacturers may well take a leaf from the book of the National City Bank of New York. In order to provide men for its many foreign branches, this great institution has worked out a plan of cooperation with universities and colleges whereby promising juniors and seniors are taken into the bank during their summer vacations and upon their graduation are placed in a preparatory training class. During these periods of training every effort is made to teach them not only the fundamentals of the business they are to represent, but those things which are so essential to foreign work, such as national characteristics and customs, methods of doing business and practical business conversation in the required foreign tongue.

England and Germany have long been pursuing similar methods in the promotion of foreign trade, and such a course on the part of American industrial as well as banking firms will do much to obtain and secure our logical share of the world's commerce after the war.

IF THE RESULTS OF GERMANY'S U-BOAT ACTIVITIES are measured by arrivals of crude rubber from England, the campaign is a failure.

For the first six months of 1916, approximately 11,000 tons of crude rubber was imported to the United States from London, Liverpool and Hull. For the first six months of 1917, there were 24,000 tons, or more than double that amount, from the same ports, and that despite the German submarines.

What I Saw in the Philippines—II.

By the Editor of The India Rubber World.

Kobe and Away—The Inland Sea and the Yellow Sea—Some Chinese Characteristics—Mr. Chang—Earlier Meetings with This Remarkable Oriental—His Corona Corona Experiment—I Meet Him Again in Shanghai—His Description of Tu Chung Rubber—He Elucidates His Plan for Tu Chung Plantations in the United States—An Astounding Scheme for Bringing About a Second "Rubber Boom."

IT is a long journey from New York to Manila, but one broken by several interesting way stations. In midwinter the stop in the Hawaiian summer land is very grateful, but after that it is distinctly cold. Indeed, sailing from Vancouver, and of course taking the extreme Northern circle to save miles, it is frigid at first, then cold, and finally off Formosa chilly and then warm.

Our stop in Kobe was brief, cold and uninteresting. Incidentally, as small pox was raging in Osaka, all on board were vaccinated. The voyage through the Inland Sea was dreary, snow squalls and chilly winds being the rule. And when we ran out into the Yellow Sea, it was not much better, as everything was blotted out by a bitterly cold, dense fog. We had a lot of Chinamen aboard, steerage passengers, and as first class passengers many Americans, Standard Oil men, and others resident in Shanghai. As we neared their home port they talked China very informingly and quite enthusiastically.

THE CHINESE BANK, SHANGHAI.

I wonder why we look with such tolerant contempt upon the Chinaman? A few hundred years with Bryan as our Confucius and our population grown to 600,000,000 would see the Americans just the same type of non-resistant, much-enduring creatures, and possibly wearing pig tails by decree of some autocratic boss. I doubt, however, if we ever were as universally honest as they.

I have always liked the Chinese, they are so bland, cheerful and fatalistic. They also are past masters in the art of minding their own affairs. A steamer friend went with me down to the steerage to see the Fan-tan, Chuck-a-luck, and other games. He was an adept at pigeon English and he spoke thus to one husky Chinaman.

"Sposee Jap man come chop chop makee fight?"

"No blong my pigeon, blong soldier pigeon. Him makee fight," was his contented reply.

I was eager to see Shanghai again, partly because the city interested me and more because I wanted again to meet Mr. Chang. I first met him on a P. & O. boat in 1904 voyaging from Ceylon to Singapore. He was a big, fine-looking man clad in the richest of Chinese costumes, suave, observing and possessed of a serene dignity that was most impressive. Withal he possessed the keenest sense of humor mingled with a tolerance that bespoke the thinker and philosopher. The brusque Englishman, the egotistical German, and the thin-skinned, somewhat boastful American, all interested and often patently amused him.

I found him a veritable encyclopedia of information concerning affairs in the Far East. He knew rubber thoroughly; gutta percha seemed an inheritance; he confessed that his family for years had been financially interested in trading for it in the Philippines, in Borneo and Java. He knew all of the gutta grades in Singapore and was the first to give me an accurate description of the *Dyera costulata* that produces Pontianak.

I shall never forget the clever way in which he turned the tables on a young chap who guyed and patronized him by turns. After winking to the rest of us, the American told of the discovery of a geological freak in Yellowstone Park—two deposits of mineral rubber and sulphur; of their mixture by volcanic action, and of the product being forced up through a geyser in the form of tubing hundreds of miles in length. And this was but one of many which he thought Chang swallowed.

UNLOADING AT SHANGHAI.

One day, however, Chang handed him a cigar, saying:

"From the shape and the box you will think them Corona Coronas. They are, however, more costly. The Corona costs one dollar, Mexican, each. These cost me twenty dollars each. Smoke up and give me your opinion as to their value."

The guyer settled down to full enjoyment of his priceless cigar, apparently reveling in delicious aroma, praising the exquisite texture of the wrapper, expounding upon the sensuous sedative effect of—

"Some years ago," Chang broke in, "I brought home some seeds of the common American weed known as Mullein and propagated them. The leaves were rather coarse at first, but by cultivation I have arrived at a very much finer texture.

Your Corona is made of Mullein, not tobacco. I only make a box a year and that is why, including the years of experiment, they cost me so much. How do you like them?"

"Pretty good imitation, as far as the appearance goes," said the Guyer judicially, dropping the unconsumed half into a cuspidor, "but, of course, you cannot really imitate tobacco to the connoisseur. You cannot get the fine flavor, the delicious aroma, the pearly ash, the sensuous sedative effect—"

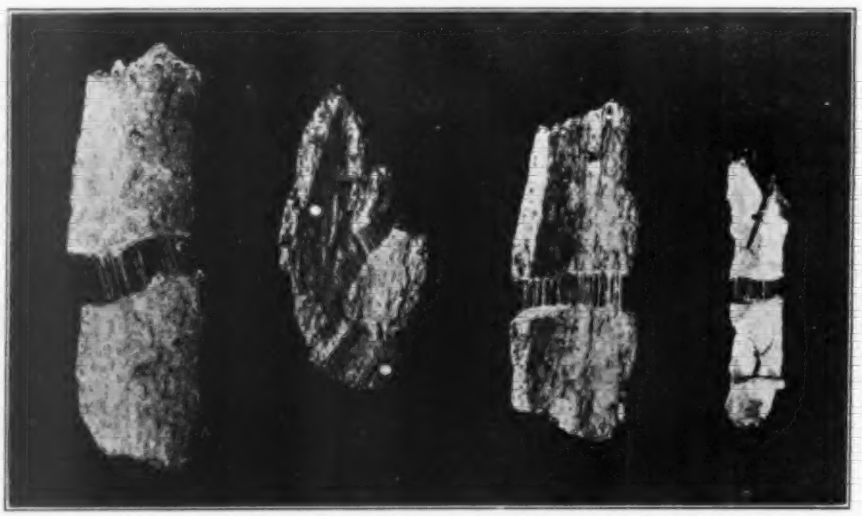
"Man without imagination is a machine, a clod," said Chang. "You have vision, imagination, great. I never even saw a Mullein leaf. You were smoking a Corona Corona of real tobacco. Have another and don't be angry. Remember the stories you have been telling to a credulous Chinaman. Remember also that lying was a fine art in China before America was discovered. Shall we cry quits and say *par verbascum!*"

I met Chang again on the "China" going from Hong Kong to Shanghai in 1905. Then I got better acquainted, and dining with him in the last named city, finally sized him up as one who would be a big man in any country, and, further, one who because of his unusual perspective would be a very sage and sane analyst of world conditions in the rubber or in any trade.

He was an omnivorous reader, and as he was a graduate of a leading English university his outlook was exceedingly broad. India rubber was his hobby. He knew it wild and planted. Not only that, but he knew the big factories the world over, had a good idea of machinery and processes, and had formed opinions of the leaders of the trade that were surprisingly accurate.

As I neared Shanghai, I, therefore, read again a letter received from him in New York the day before I had started for the Philippines. It read:

TU CHUNG RUBBER TREE, 8 YEARS OLD. ARNOLD ARBORETUM, BOSTON, MASSACHUSETTS.



BARK OF A TU CHUNG RUBBER TREE SHOWING THREADS OF RUBBER.
Photograph from the Bureau of Plant Industry, Washington, D. C.

My Dear Mr. Pearson:

To us slow thinking Orientals the tremendous growth of your American rubber business is startling. It is fully as remarkable as the rise of the British rubber planting interest which you will recall I forecasted pretty accurately in 1904.*

There are still surprises and wonderful developments in store for your trade. I could greatly desire to discuss them with you. Many American rubber men stop here *en route* for the Eastern rubber fields. Why not you? A visit from you would be most enjoyable, and I think interesting to you.

Your old friend,

Chang.

In time we hove to off the mouth of the Yangtse Kiang, waited for a pilot, and went up the great river, and the next day were ashore with two days of shore leave ahead of us.

I at once looked up Mr. Chang in his modest but luxurious apartments.

Skipping over the preliminaries of greeting and trade gossip, and getting at once to the matter that was on his mind, said he rather abruptly:

"Why do not the Americans grow rubber at home?"

"They are experimenting with guayule in Texas," I replied. "Nothing else seems to be in sight at present."

"I wonder why our Tu Chung rubber would not be of interest to your people. You know it?"

"Only in a very misty way," said I. "You mean the product of the Chinese tree *Eucommia ulmoides?*"

"That is it. That is just it, and it has a future, I am sure. The tree is about the only rubber producer in the world that thrives in the temperate zone. It stands winters such as you have in New York state without any trouble at all. The bark is full of rubber. I have many times taken a piece of the dried bark of the tree, broken it and found it full of threads of rubber. It looked like the product of the grass rubber vine of Africa."

"What quality of rubber?"

"Ah, that I don't know. The idea only came to me lately to try and introduce it into America, perhaps as a reforestation scheme. The tree really has very profitable possibilities. Here in China we use the dried and powdered bark as a medicine and it sells for $1.50 gold a pound. It is a specific for certain kinds of rheumatism, and is not poisonous. Now this same bark contains rubber, about 3 per cent, I believe. Just picture the possibilities, say, $1 a pound for a valuable drug, and more than enough rubber in it to pay for the cost of cultivation and gathering. Do you not think the experiment worth the trying?"

* The prediction of this amazing Chinaman was that the rubber production of the Malay States in ten years (1914) would be greater than that of the Amazon Valley.

"Where can I see some of these trees?" said I eagerly.

"When you return home, go to the Arnold Arboretum in one of Boston's suburbs, and you will see several. They have been growing there for some years."

That was the gist of his chat and the primary reason for his wish to see me. Of course we discussed *Hevea* planting in the Philippines, which he favored. Just back from Singapore, he also entertained me with planting gossip and information.

As I was leaving he said:

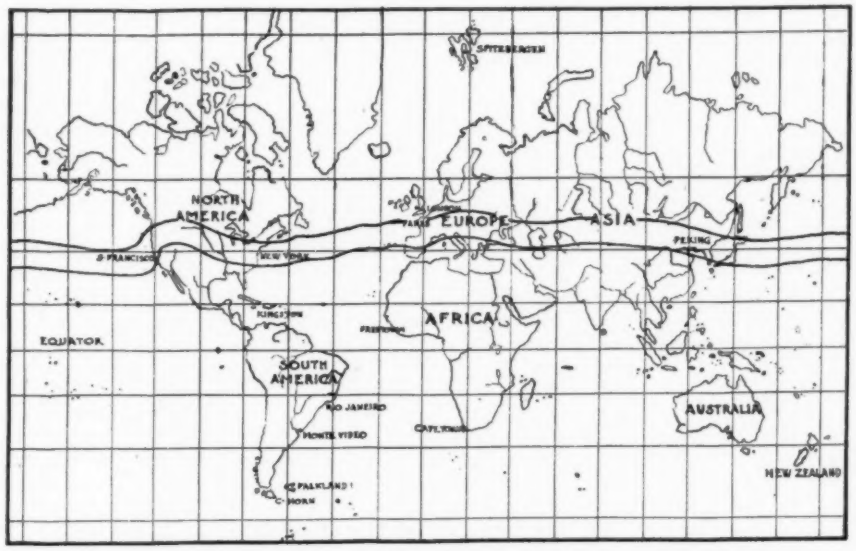
"Suppose plantation rubber in time reached a level of 30 cents gold a pound. As it drops there would be all sorts of efforts on the part of planters' associations to create artificial uses for the surplus and to curtail production to bring prices up. Personally, I believe that new and great uses for rubber will render such action unnecessary, but if one were a speculator there is a better, surer way."

"And that is?"

"Secure the bulk of the world's vulcanized rubber scrap. Distill it into caoutchoucin and other valuable by-products. If the scrap was cheap enough, and one had bought crude gum, around, say, 30 cents, when it went to a dollar the profit would be quite considerable."

The next morning, just before we sailed, Mr. Chang came aboard to say good-bye. As usual, he had something unusual to say.

"It was not Tu Chung rubber or a boom in crude rubber that I wanted to talk to you about—to get you thinking over," he said. "It was this, and I hope you will watch developments carefully. The United States and China as well will get into the world war. The Prussian, through teaching his people that they and their desires are all important, has come to possess a super-egotism that is akin to madness. His sense of proportion is entirely atrophied. The outrages in America will bear their fruit. As for China, she has been oppressed by many nations, and by the individuals of many peoples, but by none so brutally or so universally as by the Germans. So, as I said, both of our countries will enter the war on the side of the Allies. In time, say a year or two, there will come a shortage of labor. So great will this be that the huge reservoirs of willing, tractable laborers, particularly in China, will be needed. Labor unions will see that their members are not menaced. First in the tropics, and later in the temperate zones, the Chinese laborer will be used by the tens of thousands. In your own line, on rubber plantations, and in American rubber factories, you will see Chinese help. America is rich enough to afford it, and, mark my words, before the American consents to put his women folk in trousers and force them into factories, she will scour the world for masculine workers. And it should be so. It is the beginning of the world federation that will utilize, guard and profit by the producing capacities of every race under the sun."



ISOTHERMAL LINES BETWEEN WHICH TU CHUNG RUBBER WILL GROW.

"Perhaps you are right. At any rate, the tropical need for your labor is great and growing greater," said I. "There is, however, a point you seem to miss. You have lots of labor. Why not use it right where it is, right at home?"

"How?"

"Well, you believe rubber growing to be a good proposition. Start your millions of coolies growing milkweed, rabbitweed or some other minor rubber product—something that will give an annual crop. Put a million or so at it and the rubber product will be considerable."

"Maybe some time. No can do now," said Chang with a smile.

With that he departed, and we proceeded down the Yellow River, turned south and pointed the boat's nose for Luzon.

IN THE INLAND SEA.

It's a long way to Luzon—that is, from New York; it takes a solid month to get there by railroad and steamer, two months by magazine. Here I expected to find much that would be of interest and my hopes were not disappointed.

(To be Continued)

India Rubber in War.

By Robert G. Skerrett.

MUCH is heard of the part steel is playing in modern warfare, but has the world, or indeed the rubber trade itself, half grasped the extent of india rubber's vital contribution to this monster world-wide conflict? Hundreds upon hundreds of our factories are working to capacity in order to produce rubber products of one sort or another, and now that we have joined hands with the Entente Allies these establishments must expand and run well-nigh continuously to turn out a still greater volume of these myriad commodities. Our rubber industries may well look up and feel a sense of pride in the part they have played and the greater part they are bound to play in this Titanic struggle.

The past three years of war in Europe have brought to a focus the inestimable value of rubber and, what is more, have clearly emphasized the fact that chemistry's cunning has not yet evolved a really all-round substitute. Germany's initial use of motor-truck service gave a new complexion to the problem of shifting quickly great bodies of fighting men, and probably Paris would have fallen to the Teuton troops if General Maunoury had not rushed to the battle-front a whole army by means of Parisian taxicabs. All of the belligerents then suddenly awakened to the need of self-propelled vehicles, and it was not long before they grasped, as well, the fundamental requirement of an abundance of rubber tires.

THE IMPORTANCE OF TIRES.

In the earlier stages of the war wastage in tires was little short of appalling. This was due to lack of organization, the casting away of damaged tires upon the roadside, and the frequent employment of misfit tires in a service that covered rough roads with the heaviest of burdens. Among the Allies a goodly measure of order has been instituted in this extremely important department of supply and transportation, and there are now operating centers to which all injured tires must be sent. New ones are no longer issued to a driver without question as to his disposition of the worn ones. Even so, the wear and tear are tremendous, and it is said by those in a position to know, that solid rubber tires in military service seldom average more than 1,500 to 2,000 miles. This is less than one-tenth of the mileage commonly expected in commercial use. Over-loading, over-speeding, hard service in all sorts of weather upon all kinds of roads exact their toll when necessarily combined with indifferent attention, while the exigencies of the moment preclude careful driving, and hasten destruction.

A SOLDIER'S FIELD KIT.

TIRES FOR 150,000 MOTOR VEHICLES.

It is safe to say that the Allies, in their various fields of military activity, have in service for transport and staff work rubber-tired automobiles and motor trucks to the number of 300,000 or more. These machines are using up, at a conservative estimate, certainly five times as many pneumatic and solid tires as would ordinarily be expected under normal conditions. And let it be remembered that this durability is secured in a large degree by reason of rubber fillers of one sort or another that make it possible to drive the pneumatic tire until it is almost completely worn out. No wonder, then, that Germany has made desperate efforts to obtain rubber, for, despite her network of railroads, the ultimate mobility of her forces and the maintenance of their supplies of all sorts depends basically upon motor vehicles.

According to the estimates of the Council of National Defense and our military authorities, an army of a million men will require anywhere from 30,000 to 40,000 motor trucks, and bids for these have already been asked. Inasmuch as it is said that we are to raise an available and thoroughly equipped force of 2,000,000 to 2,500,000 men, we shall need at least 100,000 motor trucks for transport and supply service alone. This does not take into account the ambulances for hospital service and the thousands of automobiles that would be required for various staff duties. It is probably safe to say that we shall have to have a maintained organization of substantially 150,000 motor vehicles of one kind or another in order to keep the service up to wartime demands. With our knowledge of tire consumption abroad, and with the figures already cited, our manufacturers are clearly face to face with a giant task in this one department of the rubber industry.

MOTORCYCLE TIRES.

Very recently our government asked for bids for 10,000 motor-cycles. This number will unquestionably be greatly increased, because it is a matter of record that the British army alone has in the neighborhood of 100,000 of these machines in service to-day. So far as carrying dispatch bearers and mounted scouts is concerned, the wear and tear upon tires would be hard, but not as disastrous as the stresses of motor-truck service. However, it is evident that a large number of our ultimate array of military motorcycles will be equipped with side-cars and also provided with machine-guns. For work of this sort the motor-cycle must be both powerful and rugged, and the ultimate burden will rest upon the rubber tires. Here the tax will be excessive and it is quite likely that tire deterioration will equal that of the motor truck, because the machine-gun squads must reach their destinations whenever it is humanly, physically and mechanically possible to do so.

In connection with automobiles, motor trucks, tractors, ambulances and motor-cycles, it must be remembered that rubber is also used in a variety of subordinate ways. For instance, there is rubber in the construction of the batteries of self-

starters, the electric wiring calls for rubber insulation, and rubber is employed in the handles of starting cranks, controller levers, radiator caps, gasoline tank caps and steering wheels. Some of the ambulances used by the British have permanent features in the shape of rubber buffers and stops, and rubber flooring has made it easier to keep these cars clean and likewise to provide a surer footing when handling the wounded.

THE AIR SERVICE AND RUBBER.

Nor should the vehicle wheels of the warplane be forgotten, because it is upon these that the initial start and the safety of landing fundamentally depend. Resiliency is absolutely necessary, and rubber only will furnish the springy tire needful to facilitate rising from the ground and to help absorb in a very large measure the shock incident to landing. It is not possible here to go into the niceties of this matter other than to say that nothing but the best of rubber will serve this purpose; and the perfected flying machine tire has called for a good deal of experimenting in order to meet the peculiar demands of the service.

A UNITED STATES ARMY MOTOR TRUCK WITH RUBBER TIRES, PROOFED COVER AND DRIVER'S SHELTER.

It has been authoritatively declared that five airplanes are needed yearly to maintain a single flyer aloft, and this quota is additional to the replacement of aircraft demolished by gunfire. No wonder, then, that the French army organization, as it exists to-day, calls for 30,000 flying machines annually. This takes no account of the British, the Belgian, the Russian and the Italian service, and does not consider at all the aircraft needs of the enemy. We have virtually promised to send abroad 20,000 aviators, and to maintain a force of this size we shall have to build every 12 months quite 100,000 machines. The rubber industry will have its hands full, not only in furnishing the tires, but other rubber parts which virtually duplicate many of those of the automobile. Further, there are special features, peculiar to the warplane, incident to the mounting of machine guns, the growing equipment of wireless installations, and the need of additional shock absorbers, in the form of cushions where the radial supports converge, when bombs are carried. Finally, the best of the fighting flying machines have their wings covered with a rubberized fabric in order to prevent the absorption of moisture and the burdening of the aircraft with useless dead weight; and rubber tubing is used more or less extensively to prevent chafing where control wires and stays touch neighboring surfaces.

The seaplane, because of its frequent contact with the water, needs rubber extensively; in fact, it calls for quite as much of this material as the airplane, despite the fact that it generally dispenses with wheels for starting and landing. It is absolutely necessary that all electrical features be doubly protected against moisture, and all controls, both hand and foot, seats, gages, etc., must be either waterproof or watertight, as the case may be. The airmen must have rubber suits covering them from head to foot, and should carry air-inflated rubber life belts, together with respirators of the same material, which will make it possible for them to endure a submergence of 30 minutes in case of accident when entangled in their wrecked machines at sea. Rubber covers are now called for to protect light machine-guns whether on shore or afloat, and as many of the big seaplanes have one or more of these weapons it is plain that rubberized cloth figures very largely in this service.

As long as we are more or less up in the air, let us consider that other branch of aviation which concerns captive balloons and dirigibles. Of the latter, the most successful development among our Allies is in the form of what the British call "blimps." The blimp is a gas-bag modeled to some extent along the lines of a giant fish or whale. The first of these produced for the navy, officially known as D N-1, is 175 feet long, and has a maximum diameter of 35 feet. The outer envelope contains 2,500 yards of double-texture rubberized fabric, and the internal balloonets, of which there are two, call for some hundreds of yards more. It is said that the government will have 300 of these blimps for home service. Already the second of the sixteen contracted for has been given a trial flight, and the naval authorities are said to be enthusiastic. Large orders will undoubtedly be placed at an early date. This dirigible is provided with pontoons beneath the chassis which makes it possible for the blimp to settle upon the water. These pontoons are long cylinders of rubberized fabric stuffed with kapok, a silky fiber of great buoyancy.

Next there is the kite balloon for naval service, which is a passive elongated gas bag that can be towed from a steaming craft for the purpose of aerial scouting as well as detecting the approach of submarines or discovering U-boats in hiding below the waves. The land counterpart of the kite balloon is generally the so-called more or less globular or pear-shaped gas bag familiar to most of us. We shall probably have to have scores of kite balloons and the ordinary captive observational balloons. Plainly, our manufacturers of proofed material will have to provide us with hundreds of thousands, yes, millions, of yards of rubberized fabric. Thousands of these aircraft are now in service abroad. Rubberized gloves, rubber-banded helmets to protect the aviators in case of falls, goggles, and rubberized suits are extensively worn by the flyers in all departments of aviation.

RUBBER REQUIREMENTS OF THE ARMY.

And now let us consider the rubber needs of the army fighting man, *per se*. During the past fiscal year, that of 1916-1917, the War Department called for bids on 47,312 ponchos and 24,380 slickers. These, it will be remembered, were to cover the requirements only of the army's regular peace time establishment. The specifications for the cloth demanded a rubber content of not less than 30 per cent of the best Up-river fine Para rubber or best Ceylon rubber and not more than 6½ per cent of the best reclaimed rubber. Counting the proposed initial force of 650,000 in the National Army, 300,000 in the standing army, and State Militia or National Guard to the number of 300,000—as it would be if recruited to the maximum—this gives us some idea of the number of ponchos and slickers needed in the first six months of conflict. Every man and officer has either a slicker or a poncho. This, in substance, constitutes the regulation rubberized clothing prescribed heretofore by the United States military authorities.

To-day, because of the lessons learned on the battle-fronts abroad, particularly those taught by trench warfare, rubber equipment of a variety of sorts is now recognized as indispensable. Owing to the well nigh continual presence of water in the trenches, rubber hip boots have become a regular part of the soldier's equipment, and in many cases the rubber stocking, worn between two woolen or cotton socks, meets the average need at any time but stormy weather. The rubberized ground sheet, with which each fighting man abroad is supplied is the European substitute for our poncho. It not infrequently has served as a shroud when the soldier has fallen on the battlefield. The wastage in trench boots, rubber stockings and ground sheets is enormous; in fact, it has been estimated that the total wastage of all rubber goods at the front, 18 months ago, was in the neighborhood of 4,000 tons daily. This destruction has unquestionably greatly increased in the interval, and will be a good deal higher after we join forces with our Allies.

The officer boasts some additional rubberized articles, such as a waterproof valise, a sleeping-bag and a collapsible rubber bathtub or basin. Staff officers also are provided with rubber fabric motoring-rugs, and all of the men of the motoring-service have rubber garments, while motorcyclists have proofed overboots and leggings combined. Rubberized cap-covers are well-nigh universal, and a combination hood and cape of waterproof material is growing steadily in favor. The gas mask, in which proofed fabric and rubber sponges play a prime part, is a universal article of equipment. Every man and officer must have one, and a substantial reserve should be available to take care of wastage. With every mask there should be a waterproof wallet in which to keep the respirator which neutralizes the action of the poisonous atmosphere.

THE RUBBER-TIRED WHEELS OF AN ARMY AIRPLANE, SHOWING THE RUBBER CUSHIONS IN THE AXLE SHOCK ABSORBERS WHERE THE RADIAL SUPPORTS CONVERGE.

The foregoing equipment of rubberized articles or garments is necessary, in fact is the regulation outfit abroad; and we shall have to provide our troops accordingly. In addition it is optional, especially among the officers, to supply themselves with waterproof toilet cases, pocket filters with rubber tubing, and goggles that call for more or less rubber in their make-up. Rubber gloves are extensively in demand in certain branches of the military service, particularly where live electrical circuits have to be dealt with and also in the handling of certain explosives. This is notably the case in the charging of mines, floating and otherwise, and wherever guncotton is used for the bursting charge.

Regarding the need of rubber in its protective capacity against the attack of acids, the manufacture of smokeless powder, guncotton, nitroglycerine, dynamite, etc., calls for rubber gloves and rubber aprons, not to mention boots. Every pound of these explosives utilizes sulphuric and nitric acid at one stage in their preparation, and it would be impossible for the workers to perform their tasks without the aid of rubber garments. Many hundreds of thousands of tons of explosives have been produced since the war began; enormous quantities of nitric acid, sulphuric acid, and other chemicals have been manufactured in the last two years and a half; and in the whole of this grim industry, rubber in one shape or another has been indispensable. This business of providing munitions has grown to tremendous proportions in this country, and the factories will work to still greater productiveness in order to furnish our army and our fleet with its needful explosives.

An integral part of modern warfare is the extensive use of the telephone; indeed, fire control is well-nigh universally regulated in this way. Everyone knows how important rubber in one form or another is to an efficient telephone service, and on the battle-front that service absolutely must be efficient in every particular. Therefore, insulation is insisted upon to an extent that is not deemed needful ordinarily, and mainly because the physical conditions are infinitely more trying Nothing answers like rubber for this purpose, where wet ground and continual moisture have to be contended with. Again, there are the circuits of mining and countermining operations, improvised lighting and power systems — particularly where searchlights are employed— and wire entanglements are charged with high-voltage currents. Thousands upon thousands of miles of insulated wire have been and will be required. Our own fighting force in Europe will have to be supplied generously in kind.

As part of the transport service and the "supply train" equipment, we must not forget waterproof motor hoods, cart covers and collapsible rubber horse troughs, water buckets and tanks. And that the powder shall not fail in the hour of need there is also provided a vast array of rubberized powder bags. The treads of the "tanks" and the heavy guns and mortars also need rubber blocks to make them equal to the varied conditions of the roads or ground over which they have to make their way. And, finally, in considering the army's needs, those aids to effective fighting, field glasses, range-finders and telescopic sights must be included. In all of these optical auxiliaries either hard or soft rubber, or both, are required, and while quantitatively the amount of this material is trifling compared to rubber's other uses, still its service is important.

RUBBER REQUIREMENTS OF THE NAVY.

Our navy has long been a big consumer of rubber, and even

in times of peace the fleet's demands have grown steadily year by year. It is not possible to give more than an approximate idea of the amounts, simply because the shipbuilders provide the bulk of this when the vessels are constructed and Navy Department advertisements for any twelvemonth cover only wear and tear or replacements. But the volume of these replacements is suggestive, and shows some of the directions in which rubber enters into the effective work of our battle craft and the outfitting of our bluejackets. Therefore the following list is given:

MUCH RUBBER IS USED IN THE MAKE-UP OF THE NAVAL DIVER'S EQUIPMENT.

Rubber hose, all kinds	3,000 feet
Hard rubber knobs (electric service)	1,100
Gaskets, various	32,000
Boots	8,500 pairs
Squeegee blades	25,000
Washers	3,000
Elastic webbing	5,000 yards
Buttons	110,000 dozen
Rescue breathing apparatus	100 sets
Diving apparatus, complete	14 sets
Diving suits	150
Rubber packings	1,500
Sheet rubber for packing	442,000 feet
Rubber insulated wire, ignition circuits	1,000 feet
Rubber insulated cable	600 feet
Rubber gloves, acid proof	1,520 pairs
Hard sheet rubber	3,500 pounds
Rubber pump valves	2,250 pounds
Rubber ferrules	27,600
Rubber insulating tape	9,450 pounds
Acid-proof rubber belting	500 feet

Manifestly, these are by no means all of the ways in which rubber is used in the navy. Rubber tiling or rubber flooring and rubber mats, step treads, door stops, and the like, are to be found in every direction on fighting craft of all sorts. The dreadnought boasts an electric power plant that would meet the needs of a good big town. This form of energy must be perfectly controlled and only the best of rubber insulators will answer. Therefore this material has an extremely wide service to perform in this department alone; and, because of the character of the original installation, replacement is seldom required except upon a modest scale.

As can readily be understood, the submarine, with its dual motive system and recourse to electrical propulsion when traveling under water, uses rubber more extensively than any other fighting craft—judged upon the basis of its total displacement or dead weight. The batteries have hard rubber containers or jars; the positive and negative plates are isolated by hard rubber separators, and the accumulators have other hard rubber fittings. Sponge rubber condensers serve to arrest the particles of electrolyte in the rising gases, and frequently soft rubber ventilating tubes are provided to draw off and to exhaust forcibly any accumulation of hydrogen. Because of the moist atmosphere, induced by the sweating hull plating, all electrical wiring and connections have to be insulated with the utmost care. This is especially necessary in view of the high potential of the current fed from the batteries to the propulsive motors and to the various electrical auxiliaries that now do much of the operative work in a submarine. The under-water boat has a number of hatches and openings to the sea of large diameter which must be sealed hermetically when the craft submerges, and in order to insure this watertightness, seatings or gaskets of extra heavy soft rubber are employed. The doors of the various watertight compartments also are made secure by rubber packing, while rubber matting, rubber treads, etc., are found in many directions.

The wireless outfit, of course, has its necessary measure of insulation provided by hard and soft rubber; the periscopes are made watertight and yet free to move by means of rubber packing; the electricians have to have rubber gloves and use rubber tubing in testing and overhauling the storage batteries; the internal lighting system, of course, is safeguarded by rubber-covered circuits; and, finally, the submarine's prime weapon, the torpedo, cannot get along without rubber—especially the rubber diaphragm which plays a vital part in the torpedo's depth control. Rubber, too, enters into the construction of the submarine mine which, as we all know, can be carried and planted by under-water craft. Of course, the officers and crews of submarines, because of the exceptionally wet work of the service, have hip-boots of rubber and, generally, hats and overdress of the same material. Escape helmets for the personnel of submarines contain a good deal of rubber in their make-up, and all of our under-water boats are supplied with these.

THE RUBBER SUIT OF A SEAPLANE PILOT.

At the present time it is not in keeping with the policy of the government to go further into detail as to quantities of any of our fighting material. It was for that reason that a list was given of an average rubber consumption for a peacetime year in the fighting fleet. Under normal circumstances, the enlisted personnel of the navy is less than 60,000. Now, with many of our ships in reserve fully commissioned for wartime service, with scores of auxiliary craft added to the fighting fleet, and with the Coast Guard a part of the regular navy, it is safe to

say that our water-borne defense force numbers in the neighborhood of 150,000. These figures will serve to give an approximate notion of the increased demands for rubber equipment for the men, as well as rubber needed aboard the augmented fleet. Indeed, the drive of wartime duty is sure to add greatly to the figures of peacetime consumption.

It will be borne in mind, besides, that the Marine Corps has been raised from 17,000 to substantially 30,000 men. The Marines need an equipment similar to that of the army man, but as our sea soldiers are expected to fight ashore and afloat they must be thoroughly prepared to meet the physical conditions of either service. No mention has been made of the Naval Militia, *per se*, because this excellent body of State fighting men is now amalgamated, almost in its entirety, with the personnel of the battle-fleet.

So far, nothing has been said about the medical departments of the army or the navy, as such, simply because the whole subject of taking care of the wounded can just as well be treated for both services under a single head. It is quite out of the question to give details as to quantities, but a recital of some of the uses to which rubber is put by the military surgeon and the military hospital will suffice to suggest the volume of these commodities that must be supplied continually from now on. In any estimates, it is only safe to assume that sooner or later our navy, in its entirety, will have to share in the ravages of battle. And whether it does or not, medical provision for such an emergency will have to be made.

HOSPITAL RUBBER REQUIREMENTS.

To begin with, the army that is to be sent abroad at the earliest moment will need quite 28,000 doctors, and the medical corps of the navy should total no fewer than 2,000. All of these men must have rubber gloves and, preferably, rubber operating aprons. Only recently, one of the British War Commission declared that on a short section of the front as many as 20,000 to 30,000 are wounded in the course of a battle lasting but a few hours! Happily, quite 50 per cent of those hurt are able to return to duty within a comparatively short period, and experience has shown that 25 per cent, after furloughs for convalescence, can return to the front; and, finally, something like 17 per cent, after more or less prolonged stays in hospitals, are able to resume their duties. However, these results in any case are made possible only by the best of surgical treatment, and, because of the constant danger of infection, a great many of the wounds call for careful and systematic sterilization. It is in this work that rubber plays a prime part in the form of tubing, which is an essential feature of the present apparatus employed to drain or irrigate the wounds.

Another revolutionary innovation is a system of elastic bandages which, without stitching, pull the wound surfaces gradually together and produce a minimum of deformation. All of the ambulances, operating rooms, and surgical wards require rubber sheeting. There are hot water bags, ice bandages or caps, pads, inflatable pillows and mattresses calling for rubber or proofed material; bulb and bag syringes, medicine droppers of first-aid packets, basins, sprays, operating caps, crutch tips, ether bags, bottle stoppers, sponges, catheters, rubber flooring, rubber heels for hospital attendants, rubber-tired wheelbarrows for carrying stretchers, and hundreds of other ways in which rubber helps to save life, eases the wounded, and effects administrative economies in the military hospitals either in the field or at the bases. Rubber gloves and aprons are quite as necessary for the nurses and ambulance attendants as they are for the surgeons. Of nurses and other attendants there must be a small army for a fighting force of a million and more men at the front. Further, the care of the wounded will not be the only concern. Despite serums and the like, disease may lay a heavy toll upon our fighting men on the fields of Europe. And in the treatment of fever stricken soldiers, rubber articles of one sort or another will be indispensable in steadily increasing quantities.

At the time of writing this article, the American flag is flying over six great base hospitals in France—institutions wholly administered by American surgeons and physicians. Just what this means can be gathered from the equipment of a single unit. Each of these comprises 1,600 beds; and the total of the six hospitals is 9,600 beds! What we shall have to provide for when our part in the conflict is in full swing is, of course, purely speculative. However, it is evident, from what has been needed in the treatment and care of the wounded of the Entente Allies, that we shall have to provide enormous quantities of rubber surgical goods available on the other side of the Atlantic and likewise very large supplies ready for our fighting fleet.

PROTECTED OCCUPATIONS IN ENGLAND.

IN England, where conscription has greatly depleted working forces, it has been found desirable to prepare a schedule of protected occupations affecting men employed on Admiralty, War Office, or munition work, or in railway workshops, Admiralty work being taken to include merchant shipping. It is not intended to enlist such men as had attained the age of 32 on January 1, 1917, and for the present such men who are not passed fit for general service, "Category A," will not be recruited. Otherwise the schedule is provisional and subject to revision should army needs require a further release of men, or should it develop that some of the occupations might later be undertaken by women or older men. Those engaged in the occupations cited and within the age limits will be posted for military duty only after consultation with the local representative of the Government Department concerned.

Rubber Manufacture is given a special section, and the following classes of workers are protected when the individuals had attained on January 1, 1917, the age specified in brackets in each case or were engaged in the occupation (not necessarily with the same employer) on or before August 5, 1917:

HOSPITAL GOODS. Departmental foreman (23), cutter (25), molder (23), process workers (including calender hands) (23), stover (23), spreader (25), surgical tubing (maker of, including catheters) (23), vulcanizer (wet) (21), vulcanizer (dry) (25). Protection applies equally to men engaged in contracts for public and private hospitals.

OTHER RUBBER GOODS. Foreman (27), calender man (27), mixer (27), molder (27), spreader (27), hose maker (25), vulcanizer (wet) (21), vulcanizer (dry) (25), ring and washer cutter (25).

In the allied trades the following occupations are protected:

CANVAS HOSE PIPE MANUFACTURE. Tackler (28), tenter (28), weaver (28).

WOVEN BELTING MANUFACTURE. Stretcher (27), painter (27), finisher (27).

ASBESTOS MANUFACTURE. Skilled workmen only (23).

ELECTRICAL INSULATING MATERIAL MANUFACTURE. Skilled workmen only (applies to workmen of all ages).

ELECTRICAL WIRE AND CABLE MANUFACTURE. Skilled workmen only (applies to workmen of all ages).

MANUFACTURE OF ENGINE AND PUMP PACKINGS AND JOINTINGS. Skilled workmen (21).

This schedule confers no right of exemption from military service if skilled artificers needed by the army cannot be supplied from other sources or it is possible to find substitutes. Men having bad records of absence from work will obtain no protection by reason of their occupation.

"Rubber Machinery," Mr. Pearson's newest book, filled with valuable information for rubber manufacturers, is now ready for mailing. Price, $6.

War News of the Rubber Industry.

THE participation of the rubber industry in the nation's war plans continues with the utmost enthusiasm. Preparedness in the great struggle for world freedom progresses without abatement along many lines, and in the opinion of leading rubber men will so continue until Allied arms are victorious.

The oversubscription of the two billion dollar Liberty Loan by $1,035,226,850 showed the American will; the ease with which the Red Cross fund of $100,000,000 was considerably exceeded showed the American heart. In both campaigns the rubber business was handsomely represented. And now the Rubber Trade Roll of Honor is beginning to show in a substantial manner individual American grit and determination. It does the heart good to study those names, to note the goodly proportion of native Americans among them, and also to realize what American ideals and institutions mean to our foreign-born population—that the United States is indeed the world's melting pot and that in this war, lovers of freedom, regardless of their origin, are to stand shoulder to shoulder fighting for the common cause.

Once more THE INDIA RUBBER WORLD urges its readers to cooperate in stimulating war enthusiasm by sending for publication particulars of all patriotic acts and movements, corporate and individual, in order that this permanent monthly record of what the American rubber industry is doing for the defense of liberty and justice may be complete.

The Rubber Workers' Bit.

Why should the Yankee rubber man indulge in sad repining, when every khaki-colored cloud has its own rubber lining? As for our soldiers you can bet we'll keep the mills a' working. No slackers in our crowd can get, nor one that thrives by shirking! A thousand spreaders hard at work will furnish mackintoshes. Another thousand calenders are running on galoshes. Ground sheets by millions we will make to wrap the boys like mummies, and water bottles by the case, to put on aching "tummies." Trench boots and blankets, too, we'll send in effort never ceasing, and, as the call for more comes home we'll just go on increasing. We'll send them tires in ship-load lots and inner tubes as well; with gas masks for the blast that comes straight from the Boches' hell. Among us all will ne'er be found a single sneaking miser! Carloads of jar rings we will give to help them "can the Kaiser." So each will do his little bit in working, giving, trying, to help the boys out at the front, a' marching, fighting, flying.

THE LIBERTY LOAN.

Through the courtesy of Frederic C. Hood, treasurer, Hood Rubber Co., Watertown, Massachusetts, we are enabled to publish the accompanying list of New England subscribers in the rubber trade. It will be recalled that at the request of Alfred L. Aiken, governor of the Federal Reserve Bank of Boston, Mr. Hood represented the rubber industry on a committee of New England manufacturers to promote the sale of the bonds among factory operatives, office and sales forces. To his enthusiastic initiative in working out a partial payment plan, circularizing every New England rubber concern and encouraging participation and cooperation, is due a goodly measure of credit for the handsome total of $1,754,455 shown by the appended list. This is still incomplete, however, the returns from a number of factories of the United States Rubber Co. and several other firms not yet having been received. The final total is expected to be well above $2,000,000.

Of the $1,400,000 worth of bonds taken by employes of the United States Rubber Co., New York City, $67,000 was subscribed by the Hartford, Connecticut, plant, $125,000 at the Morgan & Wright plant, Detroit, Michigan, and $560 at the Denver, Colorado, branch.

A vigorous campaign for subscriptions among employes of The Goodyear Tire & Rubber Co., Akron, Ohio, netted 12,700 persons who obligated themselves to purchase $800,000 worth of bonds on the $1 weekly instalment plan.

Twenty-seven nationalities were numbered among the 11,000 odd employes of The B. F. Goodrich Co., Akron, Ohio, who subscribed $750,000.

Practically every employe of the Polack Tyre & Rubber Co., New York City, subscribed for at least one bond.

LIBERTY LOAN SUBSCRIPTIONS BY THE RUBBER INDUSTRY OF NEW ENGLAND.

COMPANY.	No. SUBSCRIBERS.	TOTAL SUBSCRIPTIONS.
Acushnet Process Co., New Bedford, Mass.	36	$7,000
American Mills Co., Waterbury, Conn.	198	24,900
American Steel & Wire Co., Worcester, Mass.	618	42,050
American Wringer Co., Woonsocket, R. I.	184	11,100
Anchor Webbing Co., Woonsocket, R. I.	47	7,850
Appleton, F. H. & Son, Inc., Boston, Mass.	...	10,250
Apsley Rubber Co., Hudson, Mass.	250	20,450
Archer Rubber Co., Milford, Mass.	15	11,000
Athol Mfg. Co., Athol, Mass.	2	400
Atlantic Rubber Co., Atlantic, Mass.	2	400
Bailey, C. J., Boston, Mass.	7	750
Bauman Rubber Co., New Haven, Conn.	12	650
Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.	133	12,250
Blakesley Novelty Co., Bristol, Conn.	19	7,450
Boston Belting Co., Boston, Mass.	178	39,250
Boston Insulated Wire & Cable Co., Boston, Mass.	11	6,550
Boston Rubber Shoe Co., Malden, Mass.	1,838	85,970
Bourne Rubber Co., Providence, R. I.	100	10,000
Boston Woven Hose & Rubber Co., Cambridge, Mass.	1,021	100,000
Carr, F. S. Co., Framingham, Mass.	...	10,000
Carton Belting Co., Allston, Mass.	30	2,000
C. C. C. Fire Hose Co., Canton Junction, Mass.	4	700
Clapp, E. W., Rubber Co., Hanover, Mass.	61	3,950
Colton, Geo. S., Elastic Web Co., Easthampton, Mass.	36	$3,800
Conant, Houghton & Co., Inc., Littleton, Mass.	30	2,150
Crandall Packing Co., Boston, Mass.	1	50
Converse Rubber Shoe Co., Malden, Mass.	508	30,000
Crocker Rubber Co., Brockton, Mass.	3	150
Davidson Rubber Co., Boston, Mass.	30	11,200
Davol Rubber Co., Providence, R. I.	176	21,500
Day, H. P. & E., Inc., Seymour, Conn.	120	19,450
Easthampton Rubber Thread Co., Easthampton, Mass.	38	10,000
Electric Cable Co., Bridgeport, Conn.	284	27,000
Elastic Tip Co., Boston, Mass.	6	1,200
Everlastik, Inc., Boston, Mass.	652	40,600
Feinberg, David Co., Chelsea, Mass.	3	1,000
Ferdinand, L. W. & Co., Boston, Mass.	3	1,150
Fisk Rubber Co., Chicopee Falls, Mass.	540	250,000
Fitchburg Rubber Co., Fitchburg, Mass.	2	150
Franklin Rubber Co., Boston, Mass.	5	500
Garlock Packing Co., Boston, Mass.	7	1,350
Glendale Elastic Fabrics Co., Easthampton, Mass.	176	10,150
Globe Rubber Works, Inc., Boston, Mass.	10	2,000
Goodrich, The B. F. Co., Portland, Me.	5	350
Goodrich, The B. F. Co., Providence, R. I.	6	550
Goodrich, The B. F. Co., Worcester, Mass.	4	250

Granite State Rubber Co., Manchester, N. H.	2	100
Hale, Alfred, Rubber Co., Boston, Mass.	1	100
Hanover Rubber Co., West Hanover, Mass.	12	800
Hardman Tire & Rubber Co., Boston, Mass.	1	50
Hartford Rubber Works Co., Hartford, Conn.	1,185	78,300
Hauthaway & Sons, Inc., Boston, Mass.	12	7,350
Haverhill Rubber Co., Haverhill, Mass.	1	50
Hayward Rubber Co., Providence, R. I.	1	300
Hazen Brown Co., Brockton, Mass.	1	20,000
Hood Rubber Co., Watertown, Mass.	3,146	201,900
Hope Rubber Co., Providence, R. I.	5	1,750
Howe, Oliver R., Lynn, Mass.	2	200
Jacoby, Ernest, Boston, Mass.	4	700
Jenkins Rubber Co., Boston, Mass.	...	1,500
Johns-Pratt Co., Hartford, Conn.	238	35,000
Killion Rubber Co., Dorchester, Mass.	4	2,050
Korker Rubber Mfg. Co., Reading, Mass.	1	150
Lawrence Rubber Co., Lawrence, Mass.	4	300
Lowell Insulated Wire Co., Lowell, Mass.	7	12,000
Lynn Rubber Mfg. Co., Lynn, Mass.	5	250
Mason, Joseph, Waltham, Mass.	3	200
Meade Rubber Co., Stoughton, Mass.	30	1,400
Mechanical Fabric Co., Providence, R. I.	44	2,650
Monatiquot Rubber Works Co., South Braintree, Mass.	101	13,000
Monnier, Ernest	1	500
Narragansett Rubber Co., Bristol, R. I.	203	10,200
National India Rubber Co., Bristol, R. I.	1 650	150,000
Needham Tire & Rubber Co., Charles River, Mass.	60	6,200
Omo Mfg. Co., Middletown, Conn.	67	4,000
Panther Rubber Mfg. Co., Stoughton, Mass.	62	5,100
Plymouth Rubber Co., Canton, Mass.	124	10,000
Reading Rubber Mfg. Co., Reading, Mass.	122	18,700
Republic Rubber Co. of Mass., Boston, Mass.	7	800
Rider, P. R., Worcester, Mass.	3	2,200
Rubber Regenerating Co., Naugatuck, Conn.	340	20,900
Ryan Ideal Stain Blacking Co., Lynn, Mass.	12	2,150
Sanford Mills, Reading, Mass.	48	3,100
Seamless Rubber Co., New Haven, Conn.	88	6,300
Simplex Wire & Cable Co., Boston, Mass.	262	116,350
Springfield Rubber Co., Springfield, Mass.	16	750
Standard Woven Fabric Co., Walpole, Mass.	330	30,000
Stowe & Woodward Co., Campello, Mass.	26	1,300
Taunton Rubber Co., Taunton, Mass.	13	650
Tyer Rubber Co., Andover, Mass.	298	28,000
U. S. Rubber Co., 130 Essex street, Boston, Mass.	1	300
U. S. Rubber Co. of N. E., 280 Summer street, Boston, Mass.	46	3,850
U. S. Tire Co., Worcester, Mass.	4	300
Whitney Blake Co., New Haven, Conn.	315	35,000
Wood, I. W., Elastic Web Co.	52	10,000
Woonsocket Rubber Co., Woonsocket, R. I.	1,335	58,235
Total	17,706	$1,754,455

THE RED CROSS.

Rubber companies and their employes responded generously in the recent campaign to raise $100,000,000 for the American Red Cross. Unfortunately the following list of donations is far from complete, many companies not having announced their totals.

On June 22 Akron, Ohio, had exceeded its quota of $150,000 by $11,372 and a new mark of $200,000 was set. The team headed by P. W. Litchfield, vice-president of the Goodyear Tire & Rubber Co., had raised $15,800, and that headed by R. M. Pillmore, president of the Mohawk Rubber Co., $5,168. Barberton, Ohio, had raised $42,000.

In a four days' campaign 98 per cent of the entire working force of the Goodyear Tire & Rubber Co., Akron, Ohio, was enlisted as members of the Red Cross. In all, 17,865 names were secured.

The Somerset Rubber Reclaiming Co., New Brunswick, New Jersey, has enrolled all its men in the American Red Cross, paying their dues for one year.

The McGraw Tire & Rubber Co., East Palestine, Ohio, from the president down to the janitors, contributed to this worthy cause, the total being $1,600.

The National Tire & Rubber Co., East Palestine, Ohio, gave $600.

The employes of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, gave $341.06, including the subscriptions of 212 new members.

AMBULANCE WORK.

Richard G. Conant, for four years tire fabrics salesman for Brighton Mills, Passaic, New Jersey, who sailed for France June 30 as a member of the American Volunteer Ambulance Corps, will drive a $3,000 ambulance purchased with a fund raised by those interested in Brighton Mills and other friends of Mr. Conant.

COMFORTS FOR THE NAVY.

The young women in the various departments of the United States Rubber Co., at the New York City offices have formed a knitting unit, and now spend a portion of their lunch hour in the footwear sample room knitting jackets, socks, wristlets, mufflers, etc., for the Comforts Committee of the U. S. Navy League.

ENLISTMENTS EXCEED GOVERNMENT QUOTA.

Of the 1,600 men of conscription age registered for the selective draft at the plant of the Hood Rubber Co., Watertown, Massachusetts, 160, or 10 per cent, have already enlisted. This exceeds the quota of about 7 per cent required by the Government to give an army of 670,000 out of nearly 10,000,000 eligibles at the first draft. Despite its many foreign workers this factory seems to be a hotbed of patriotism. Of the total 7,400 employes about 5,000 are men.

WOMEN TO REPLACE ENLISTED MEN.

Women will replace many of the operatives in the plants of the General Electric Co. at Lynn., East Boston and Pittsfield, Massachusetts; Schenectady, New York; Harrison, New Jersey; Erie, Pennsylvania, and Fort Wayne, Indiana, many of whom have enlisted and still more who will respond to the first selective draft. The names of 12,000 young women are already enrolled on the alarm list awaiting a call when needed. It is understood that they will don overalls as the only sensible factory uniform for their new work.

At the Lynn, Massachusetts, factory, 63 apprentices in the naval and military service were tendered a farewell reception by their fellow employes recently. General Manager Walter C. Fish, Chief Consulting Engineer, Magnus W. Alexander, and Prof. Elihu Thompson delivered addresses.

All employes will henceforth work a half hour extra each week, their earnings being donated to the Mutual Relief Fund for assistance to men in active service and their dependents.

INCREASING THE FOOD SUPPLY.

The office staff of the tire factory of the Canadian Consolidated Rubber Co., Kitchener, Ontario, has a splendid garden near the factory which promises a bumper crop of beans and other vegetables. Factory Manager Kabel and Superintendent Gruenwald have been enthusiastic participants in the hard work of plowing, planting and cultivating.

COMMERCIAL ECONOMY.

Just as consumers of foodstuffs are being urged to eliminate all waste, to practice sensible economy and to discontinue the use of certain articles, so business firms are requested by the Commercial Economy Board of the Council of National Defense to limit the number of styles of manufactured articles and the practice of goods on consignment, that waste may be reduced to the minimum; to reduce or abolish retail deliveries that this unproductive labor may be put to better purposes; to adopt concrete construction for their factory additions that war demands for steel may be met; and above all to unload every freight car as soon as it is received in order to break the car shortage. This latter practice will do more than any other single factor to stop the coal panic and expedite a condition of fuel sufficiency.

Official statistics of the Department of the Interior indicate that despite the extra demand in this country and the urgent needs of our Allies, no one can doubt that the coal industry will be able to supply all needs. Last year the production of bituminous coal in the United States was the greatest in the history of the country, but that record was exceeded by fully 20,000,000 tons during the first six months of this year. The difficulty of distribution is the great problem, and notwithstanding the improved car supply, this difficulty is likely to become intensified during the coming winter months.

The Rubber Trade Roll of Honor.

Reported by The Rubber Association of America.

Numbers in parenthesis following individual names indicate branches of service as shown by the key list on pages 642-643.

ACUSHNET PROCESS CO., NEW BEDFORD, MASSACHUSETTS.

H. S. Spooner (13)
A. Belleveau (13)
J. Reindeau (13)
F. Silvia (13)
J. Dansereau (14)
A. Millette (15)

F. H. APPLETON & SON, INC., BOSTON AND FRANKLIN, MASSACHUSETTS.

U. S. ARMY.

R. McFarland
T. Campbell
John Muller

MASSACHUSETTS STATE GUARD.

Francis Hawks Appleton, Jr.
William S. Goodwin
Fred L. Tufts
Arthur Wigglesworth
Louis S. Guild
Arthur Mason
Harry W. Corson

BATAVIA RUBBER CO., BATAVIA, NEW YORK.

H. Harris (7)
Floyd Blook (7)
C. Griswold (5)
C. Bohm (16)
Tom Zimarino (6)
Elva Springer (5)
A. Klinkroth (7)
M. Fisher (5)
A. Bloomer (17)
J. Cocco (17)
S. Foster (82)
Walter Gavriel (82)
L. Hayes (17)
F. Hollenbeck (82)
E. Merrill (17)

BEACON FALLS RUBBER SHOE CO., BEACON FALLS, CONNECTICUT.

J. H. Caldwell (18)
R. Wright (2)
Frank Kelleher (19)
Rudolph Lafferty (19)
William Young (19)
William Bulka (19)
Ben Goldberg (19)
T. D. Cardow (20)
William Cardow (1)
Steve Bernacki (21)
Dominick Motsky (2)
Chas. J. Jones (82)
Everett W. Wright (82)

BOSTON WOVEN HOSE & RUBBER CO., CAMBRIDGE, MASSACHUSETTS.

U. S. NAVY.

George Donald
George Fisher
Herbert Gordon
Chester Coolidge
Manuel Roderick
Joseph F. Long
Ralph J. Eaton
Fred N. Eaton

T. Grover (9)
J. De Vellis (1)
E. B. Johnston (5)
George Ahearn (18)
John Lee (18)
David J. Walsh (4)
John J. Alexander (1)
William Sullivan (1)
Walter Harvey (4)
George Durham (3)
Albert Morrisey (5)
H. S. Royce (22)
James Tisdale (23)
R. Rowe (24)

BRIGHTON MILLS, PASSAIC, NEW JERSEY.

NEW JERSEY NATIONAL GUARD.

Alexander Silver
John J. O'Brien
John Schneider
Bruno Babbles
James Delaney
Thomas McCann
William Green
Gost Manuel
John Matzy
Frank O'Neill
George Condus
Michael Rero
John Freyland
Ivan Sorken
Thomas Stewart
Joseph Galetta
Wasel Robeda
John M. Martin
Cornelius Blum
Charles E. Sage

U. S. ARMY.

Stephan Kocilevsky
Michael Bolas
Paul Schichler
Eri Cihowsky
John Novak
Thomas Matzel
Mike Pollak
John Kollar
Joseph McAteer
Vincenza Yuppa
Y. Kalienk
Peter Tomas
John Himel
Sherley Richmand
Stanley Wienclow
Max Bayduk

James Hammond (25)
Raymond Kievitt (25)
Stephan Tanzer (25)
Herman Glick (2)
Joseph Liptak (2)
Bruno Schor (2)
Miles Reninger (4)
Michale Markin (4)
Raymond P. Clarke (4)
Abe Kimmelman (27)
Jos. B. Jamieson (28)
E. P. Miller (28)
R. G. Conant (10)

CHICAGO RUBBER CLOTHING CO., RACINE, WISCONSIN.

Richard G. Bryant (29)
Clarence L. Smith (29)
William Rogan (29)
Carl Peterson (29)
Tony Dalchus (29)
Guy Greene (10)
Claudius G. Pendill (30)
Gilbert Berg (4)
Francis Peil (2)

DAVOL RUBBER CO., PROVIDENCE, RHODE ISLAND.

Robert Chatterton (31)
Joseph Carlone (1)
George Fuller (31)
Antone Hilkinback (1)
Frank Jackson (31)
Anthony Kahler (1)
Roland Pease (1)
Alfred Suar (1)
Clyde Anthony (4)
George Read (31)
Philip Clarkin (31)
Fred Riley (4)

DAYTON RUBBER MANUFACTURING CO., DAYTON, OHIO.

A. A. Blattner (1)

FIRESTONE TIRE & RUBBER CO., AKRON, OHIO.

Everett A. Brown (82)
W. D. Hines (84)
R. T. Hanks (84)
C. B. Lindeman (84)

GENERAL RUBBER CO., NEW YORK CITY.

Frederick C. Havecker (32)
William F. Strube (32)

THE B. F. GOODRICH RUBBER CO., AKRON, OHIO.

J. Boyden Limric (33)
Eugene F. Everett (3)
John F. Dippold (17)
Joseph McGoven (82)
Harlan D. Tucker (82)
Harry H. Comer (11)
Walter W. Daiker (34)
James Higgins (82)
L. Stewart Rose (35)

GOODYEAR'S INDIA RUBBER SELLING CO., NEW YORK CITY.

J. H. Leo Plant (4)
Edward Fitzpatrick (82)
Edward McCreery, Jr. (82)

THE GOODYEAR TIRE & RUBBER CO., AKRON, OHIO.

U. S. ARMY.

William Conway Boss
Ray Sederling
Folie Baker
Arthur Collier
Jerry Stallings
Frank Steele
Forest Knotts
W. J. Cox
R. Clark
W. D. Page
John M. Miller
Irl L. White
H. J. Renes
Paul Fidlen
Wilbur F. Sills
Newt Henry
Lawrence M. Wilson
Theodore Peltz
Andrew Kendra
John Faber
Alfred Caris
I. J. Rivers
H. G. Oliver
C. D. Hawk
C. York
Paul E. Smoyer
S. P. Jordan
I. S. Pierce
I. Caruth
Talmage Wright
Ersil R. Stoltz
Albert L. Smith
Elmer E. Johnson
I. B. Burley
Paul E. Depp
L. E. Fowler
Bryan A. Shannen
Walter C. Crane
Orvis T. Stafford
William H. Ricketts

U. S. NAVY.

R. S. Gale
Henry B. Smith
Wynnfield O. Weller, Jr.
E. Daub
S. Ray
Albert J. Partridge
F. Urban
Wm. Evans Stork
Frank Reynolds
A. H. Calhoun
Robert Williamson
Fred Kline
W. C. Wiggins
Arthur Treble
W. A. Johnson
Al Ferdrick
R. F. Jones
G. W. Davis
Arthur Jacob Brust
E. L. Carden
R. N. Bodine
Rhu McKituck
J. E. Hudock

U. S. MARINE CORPS.

C. L. Crook
Russell L. Arbuckle
Wilber C. Holbrook
Clair B. Little
Robert Brower
Neil Hotlel
F. F. Prior
Milton A. Pitman
George Anderson
I. Schwartz
Luther C. Shelton
John Byrd Smith
James Taylor
P. T. Wolfe
E. Swisher

U. S. MARINES.

Chas. Bowers
John B. Fahey
Samuel Callaway
George L. Stewart
Blasingame
Robert Toliver Holder
E. M. Shick
Emmett Hallawell
Constantine Tyree
Archie W. Kemper
W. F. Drake
F. R. Gibson
Pat Hudkins
Edgell Cox
H. Cook
Leo George

U. S. CAVALRY.

W. A. Ward
I. Burton
Rupar Evans
E. W. Boyer
I. R. Den
H. De Long
Ray Burke
W. Womeldorf

OHIO NATIONAL GUARD, FIELD ARTILLERY.

Thos. Michael
G. McKinnie
Chas. Brewer
Joe Todd
H. A. Hudson
Earl Youngs
C. E. Lippa
Martin Glasgow
John V. Haggerty

OHIO NATIONAL GUARD.

Chas. Harold Stoyle
James Wiseman
I. O. Thompson
Mark E. Jacobs
Walter Eickemeyer
Ned Johnson
R. J. Whiting
Paul Briggs
C. J. Huff
H. H. Webster
Nelson R. Reeder
William Seibert
Nik Pappas
E. E. Pennell
Blair W. Fisher
William H. Eyler
Charles H. Ridenor
Lloyd E. Bussert
C. J. Jeanney
Sherwood F. Smith
R. Harrison
F. S. Constant
Howard Beebe
Elmer Leland
Raymond E. Day
Bert Dougherty
Earl Hider
M. Triplett
Walter M. Burley
W. C. Cooper
R. L. Randall

WEST VIRGINIA NATIONAL GUARD.

Arlington Barthlow
William Collins
Robert Steam
Willard H. Weaver
Beverly Critz
Edgar Overn
Dwight T. James
Geo. S. Underhill
H. A. Johnson
Jess Hazlett
Charles Root
Frank Murray
G. R. Fout
Chas. A. Myers

AMBULANCE CORPS.

Earl D. Bean
J. B. Kelsey
P. Therbold
C. R. Geringer
L. H. Tutt
J. O. Hoover
E. P. McDowell
Fred Gillespie
H. Adleson

H. E. Lewin (36)
Earl William Groff (39)
Geo. W. Stacy (41)
S. E. Bunsack (43)
T. J. Polland (40)
Sears S. Day (36)
Leonard Johnson (36)
Frank J. Enright (9)
Geo. Kepos (44)
Fred M. Taylor (47)
I. J. Rivindal (49)
David Mayer (51)
A. Peck (6)
R. N. Sumerton (42)
Harry F. Beulich (82)
Urban Hunter (2)
H. H. Harkins (7)
C. R. Shetter (57)
T. B. Harris (59)
Dr. William Rogers (52)
Carl Vincent (54)
Lee Roy Burfield (17)
J. N. Shere (47)
O. V. Emerson (58)
Robert C. Hardin (82)
J. Miller (9)
Charles H. Moulton (61)
Evald M. Enstam (3)
Jay A. Cox (40)
Chas. F. Smock (42)
Coy M. Tippey (46)
Clifford Breidenstein (48)
Arthur R. Homewood (9)
Wayne S. Dilts (36)
Pearl G. Kilhefner (40)
Orville L. Simpson (8)
G. A. Lee (43)
John T. Hill (50)
Chas. S. Winslow (38)
Judson Roberts (82)
Frank Uccellini (53)
Francis A. Wilt (42)
D. White (56)
John H. Wills (40)
William Christenson (29)
Will Wallace (60)
Wilbur L. Case (82)
Samuel Cato (50)
R. Sawyer (55)
Myron McClure (51)
Fred Stoechmann (29)
Dr. L. D. Perry (40)
W. L. Benson (36)

GRYPHON TUBE & RUBBER CORP., NEW YORK CITY.

Paul Boghasian (62)
James Menasian (62)

HARTFORD RUBBER WORKS CO., HARTFORD, CONNECTICUT.

CONNECTICUT NATIONAL GUARD.

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John Dignan
Edwin G. Jones
William F. Needham
Paul Trabucchi
John W. Williams
James E. Casey
Rollie Frechette
William J. Conner
William A. Mazzoni
Joseph Tracy
Thomas E. Morgan
Anders Ridderborg
Anthony Tyszka
Ernest F. H. Clois
Frank H. Harness
Thomas Lennon
Joseph C. Orient
G. A. Waldo
William Walker
Daniel F. Daly
W. D. Hopper
Frank Hamilton
William T. Shea
George W. Voucher
Frank Murgensai
Francis G. Swan
Emery S. White

Charles Allen (63)
Wm. P. Berry (3)
David Barron (65)
Thomas E. Buckley (66)
Henry A. Gould (69)
Anton F. Hilkenback (71)
William L. Lux (72)
Robert G. Jones (69)
Joseph Murphy (64)
Rodney C. Puffer (63)
Harry T. Robertson (9)
A. N. Wilber (75)
Harry A. Perkins (3)
Michael J. Tierney (18)
Antonio Amendo (63)
Martin Bonnell (64)
Robert O. Cooley (64)
Edward Dumas (67)
Mike Fyden (68)
John F. Flannigan (69)
Charles V. Hart (70)
Lawrence Murphy (73)
Daniel J. O'Connell (69)
Carleton B. Perry (83)
Bernard I. Scott (74)
Thomas W. O'Connor (9)
Harold B. Robinson (18)

HENDERSON & KORN, NEW YORK CITY.

Albert L. Meyer (4)
J. A. Faulkner (4)

HOOD RUBBER CO., WATERTOWN, MASSACHUSETTS.

U. S. ARMY.

Volney G. Jenkins
I. H. Moore
Frank J. Cremley
Joseph R. Brown
Nishan Garabedian
John Woodoian
Tony Lee
George Goshigian
Louis Bortolino
Sarkis Fanarjian
George A. Colgan
Samuel Blacker
E. Emery
Valvan Godoshian
Patrick Nazarian
Thomas Nicholas
Felix Niemczem
Albert W. Thompson
Beriger Aniderson
Osgein Abdalian
Frank Grasey
William Footer
Leonard Smith
T. Santoro
K. Ohannesian
C. Hurin
A. Hall
Howard Laity
Avedis Ohanian
Guy Verro
Patrick Kiernan
Charles Makonski
Lawrence W. Wyatt
Dale H. Fulmer
Fenis Finnich
Edward Gunnerson
J. McDougall
S. Wilkowski
Weston D. Baxter
Nishon Nighosian
Marcar Minasian
Vahan Vartanian
Wm. Tiffany
George Karas
Joseph Giordono
G. Torosian
Thomas J. Mehorg
Harry H. Grossman
Frank Youd
Krikor Kerorkian
Anthony Mosman
G. Concordia
Ralph Deghan
Harold M. Watson
John Reynolds
John Ardoorian
Harold Ross
Edward Leonard
S. Arzanniarrian
M. Torosian
S. Najorian
H. Doyle
Clayton H. Brew
W. J. Skotlowe
Vartan Markosian
Frank Dairs
Francis Waldron
Roland Preble
Thos. D. Swift
Giuseppe Santono
William Quinimo

U. S. NAVY.

Wm. O'Keefe
John Shields
J. White
Michael Coyne

C. Cicony
Ivan Whidden
Joseph Maloney
Alfred O'Reilly
Charles Goodwin
George Stewart
Lawrence Burrell
John J. Germoyle
Wm. Clomey
K. Wasley
William Kenney
Robert Mulvaney
Chas. B. Kemp
Andrew Leonard
Matos Tawetian
Thomas Leavey
Harold Follansbee
D. Worrino
C. Nerchant
H. Sahogoni
J. McDonald
D. Zakarian
Wm. Green
Warren Albee
Paul Gormley
Michael McInerny
Robert K. Brown
John Kennedy
Paul Davis
Raymond Bryson
Frank Ryan
Manuel Acebo
Henry W. Carr
R. H. Stead
John Sartell
William Boudreau
Cleophas E. White
Rafaele Marino
Leopold Levine
Daniel Noonan
Paul T. Collins
Timothy F. Murphy
J. Trischetta
J. Dranjimetriku
H. Hohannesian
H. Markarian
Geo. Donnelly
A. La Croix
Wm. Haggerty

MASSACHUSETTS NATIONAL GUARD.

Michael Treddin
Martin Crosby
Daniel Lane
James Sullivan
William S. Bradford
Lawrence M. Wyatt
John W. Wilkes
Albert Cormier
William E. Rowan
Robert H. Hale
Wm. P. O'Halloran
John W. Wilkes
John Sullivan
Murdock Campbell

George E. Wilson (78)
Richard McCarthy (5)
Carroll Whittemore (4)
Joseph G. Murphy (7)
W. D. Roberts (5)
James D. Morgan (5)
James G. Prout (4)
T. McGrath (5)
Harold Jardine (6)
C. J. Beaudet (40)
John Carroll (4)
Arthur Footer (77)
Thomas Russell (4)
John E. Harrigan (76)
E. F. Cunningham (76)
George Stamand (6)
Herbert S. Jackson (78)
Raymond Parker (6)
S. Sanford (10)

INDIANA RUBBER & INSULATED WIRE CO., JONESBORO, INDIANA.

U. S. ARMY.

Paul Seiberling
Wayne Tucker
John Myers
Joe Sutphin
Ray Odell
Edward Monahan
Hubert Hodupp
Clarence McKee
Ray Sutphin
James Sheehan
Robert Winslow
Perry McKee

RUBBER ASSOCIATION OF AMERICA, INC., NEW YORK CITY.

Matthew Fox (17)

STERLING TIRE CORPORATION, RUTHERFORD, NEW JERSEY.

U. S. NAVY.

Harold Granger
George Granger
Fred Quackenbush
John Robertone
Virgil McManus
Joseph Conlair
Larry Oswald

A. Nicholas (1)
Harry Strickland (5)
Major J. M. Rector (53)
Joe White (79)
Oliver H. Matthews (80)
G. Henninger (1)
Harry F. Warnke (4)
Bennett Bates (4)
Charles Ellis (40)
Donald Brooks Turner (1)

UNITED STATES RUBBER CO., NEW YORK CITY.

NEW YORK NATIONAL GUARD.

M. F. Cassidy
A. F. Reilly
K. Wotherspoon
R. A. Quinn
J. McMillan
A. Schappert
G. Gordon
Samuel H. Young, Jr.

H. Bradley (81)
I. H. Hoffman (17)
H. Lobel (81)
N. H. Rowe (34)
J. F. Burke (81)
Wm. Honig (17)
P. McFadden (34)
E. Winkler (81)

KEY TO BRANCHES OF SERVICE.

1 U. S. Army.
2 U. S. Navy.
3 Officers' Reserve Corps, Plattsburg, New York.
4 U. S. Naval Reserve.
5 U. S. Marine Corps.
6 U. S. Cavalry.
7 Aviation Corps.
8 U. S. Army Field Artillery.
9 Medical Corps.
10 Ambulance Corps.
11 Red Cross Ambulance Corps.
12 American Volunteer Ambulance Corps.
13 Massachusetts National Guard, Field Artillery.
14 Fort Slocum, New York.
15 Fort Ethan Allen, Vermont.
16 U. S. Navy Yeomanry.
17 New York National Guard, Field Artillery.
18 Massachusetts National Guard.
19 Connecticut National Guard.
20 Fort Wright, New York.
21 Polish Training School, Cambridge Springs, Pennsylvania.
22 Harvard Regiment.
23 Canadian Rifles.
24 Government Inspection.
25 Machine Gun.
26 New Jersey National Guard, Band.
27 Fort Meyer.
28 Ordnance Dept., Washington, D. C.
29 Wisconsin National Guard, Field Artillery.
30 Great Lakes Naval Training Station.
31 Rhode Island National Guard.
32 Coast Defense, New York National Guard.

33 New Jersey National Guard, Cavalry.
34 New York National Guard, Engineers.
35 New York National Guard, Cavalry.
36 Ohio National Guard, Engineers.
37 Ohio National Guard.
38 District of Columbia National Guard.
39 Maryland National Guard.
40 Field Hospital Corps.
41 Illinois National Guard.
42 Pennsylvania National Guard.
43 Virginia National Guard.
44 Michigan National Guard.
45 West Virginia National Guard.
46 Missouri National Guard.
47 Ohio National Guard, Field Artillery.
48 U. S. Army Engineers.
49 Florida National Guard.
50 South Carolina National Guard.
51 Coast Artillery.
52 Surgeon, U. S. Navy.
53 New Jersey National Guard.
54 Kentucky National Guard.
55 Alabama National Guard, Field Artillery.
56 North Carolina National Guard, Cavalry.
57 Iowa National Guard, Engineers.
58 Norfolk Navy Yard.
59 Georgia National Guard.
60 U. S. Reg. Motor Service.
61 Rhode Island National Guard, Field Artillery.
62 French Infantry Regiment.
63 Fort Slocum, New York, Field Artillery.
64 U. S. Receiving Ship, Brooklyn, New York.
65 Vermont National Guard.
66 Naval Training Station, Newport, Rhode Island.
67 U. S. S. "Southery."
68 Connecticut National Guard, Field Artillery.
69 Connecticut National Guard, Naval Militia.
70 Officers' Training Corps, New Haven, Connecticut.
71 Coast Artillery Corps, Fort Adams, Newport, Rhode Island.
72 U. S. Navy Recruiting Force, Hartford, Connecticut.
73 U. S. S. "Georgia."
74 U. S. S. "Nahma."
75 Connecticut National Guard, Band.
76 Massachusetts Coast Artillery.
77 Kilties.
78 Base Hospital, France.
79 Aeroplane Reserve Corps.
80 Medical Reserve Corps.
81 New York National Guard, Coast Artillery.
82 New York National Guard.
83 U. S. S. "Kearsarge."
84 American Field Service, Munitions Transport Drivers.

NO MORE DENTAL RUBBER FOR GERMANY.

Agents of the Department of Justice believe that the smuggling of dental rubber to Germany has finally been stopped. The story is an interesting one.

Strangely enough, while Germans and Frenchmen make wonderful physicians and surgeons, they are said to be abominable dentists. Certain it is that in Germany American dentists have the very cream of the business. The Kaiser himself patronizes one of a colony of about 15 in Berlin who charged extravagant prices, maintained pretentious establishments and had practically no competition.

When war was declared their supplies of dental rubber were cut off. The German Government commandeered almost all the rubber in the country and the British blockade ships seized rubber in every shape.

Then the dentists started smuggling it through from America. The dentist would send his wife to New York. She would get a quantity of dental rubber and make bargains for its transportation with stewards, probably on the lines between New York and Copenhagen.

These men carried large bundles aboard their ships at night. At Copenhagen the rubber was expressed to Berlin. Letters were sent over in the same way, both in violation of United States laws. Agents of the Department of Justice and of the Revenue Service shadowed some of the women and the traffic stopped.

RUBBER LEADS LONDON EXPORTS TO AMERICA.

The total value of declared exports from London to the United States for the five months ended May 31, 1917, amounted to $78,779,911, compared with $77,115,135 for the same period in 1916. Of these totals rubber amounted to $20,696,269 and $31,447,629 respectively. Although the total exports for the period have increased only about $1,665,000, rubber shows a gain of nearly $11,000,000, and in fact forms 40 per cent of all exports. No wonder U-boat commanders are disheartened!

A SHIP FOR RUBBER CARGOES.

THE recent complacency of large American manufacturers regarding crude rubber supplies finds explanation in the fact that the United States Shipping Board, in consultation with the Committee on Rubber of the Advisory Commission of the Council of National Defense, has arranged for the German steamship "Andalusia," which has been interned in Manila, Philippine Islands, since the beginning of the war, to be placed on berth from Hongkong and Nagasaki to carry rubber, hides, gunnies, etc., to Seattle, Washington. The ship will load at Singapore and probably be ready to leave during the latter part of August.

The former Hamburg-American Line steamship "Andalusia" was built in 1896 and is of 5,433 gross or 3,371 net tons. For insurance purposes she is rated first class. Inquiries regarding freight space, etc., should be addressed to Frank Waterhouse & Co., Seattle, Washington.

CHEMICALS IN LICENSED EXPORT LIST.

PRESIDENT WILSON issued a proclamation July 15, declaring it unlawful to export certain indispensable commodities from the United States, unless licensed to do so. Among the materials so prohibited, named in a revised list published July 22 by Secretary Redfield, may be noted chemicals and ingredients used in the rubber industry, as follows: Benzol, toluol, naphtha, benzine, gasoline, corn oil, linseed oil, ammonia salts, rosin, sulphur and turpentine.

It is more than likely that other materials may be placed on this list under future executive proclamations. Among them it is thought that cotton and its manufactures are likely to be included.

Applications for licenses may be made to the Bureau of Foreign and Domestic Commerce, Division of Export Licenses, 1435 K street, Washington, D. C., or to any of the branches of the Bureau of Foreign and Domestic Commerce—New York, Boston, Chicago, St. Louis, New Orleans, San Francisco and Seattle.

In applying for a license to export any of the commodities covered by the President's proclamation, applicants should give the following information in triplicate form:

a. Quantity.
b. Description of goods.
c. Name and address of consignee.
d. Name and address of consignor.

The license will be good for only 60 days and at the expiration of that time must be renewed, and if not shipped within that time a new application must be made.

The various branch offices of the Bureau of Foreign and Domestic Commerce have been given full instructions as to the disposition of all applications for licenses.

It is the desire of the Bureau of Foreign and Domestic Commerce to minimize the exporter's difficulties as much as possible, and therefore wherever practicable the district offices will be authorized to issue the licenses. It is thought, however, that many of the applications may have to be forwarded to Washington for decision.

The exporter receives his license in duplicate, and turns both copies over to the steamship company in exchange for a steamship permit. The steamship company turns both the original and duplicate over to the customs authorities with its clearance papers.

Difficulties arising where the goods covered by a license are not forwarded in one lot will be settled in one of several ways. In the first place, a man may apply for and receive as many licenses as he requires. A "balance license" is being arranged for, to take care of any balance of goods which has not been shipped under the original license. A "blanket

license" is being arranged for which will cover specific commodities shipped by specific firms to certain countries.

In the case of shipments to Canada, exporters are advised that steps have been taken to facilitate these shipments, and they need not apply for a specific license. Shipments to Canada may be forwarded as heretofore.

TOURING BUREAU INDICATES STRATEGIC ROADS.

SINCE the War Department has decided to purchase 70,000 trucks for the transportation of troops and supplies, military officials are busily engaged in choosing the best available routes between important points. The Goodrich National Touring Bureau which has carefully mapped, logged and guide-posted every principal road in the United States, recently offered the government complete access to its resources, and military inspection tours of strategic routes are already being conducted. Not long ago Captain O. R. Bird, U. S. N., with a sergeant, a corporal and a driver, dashed from Salt Lake City, Utah, to Los Angeles, California, in 34 hours and 14 minutes, proving that the new Arrowhead trail is the shortest route.

GERMAN GERMS IN PLASTERS.

THE statement issued by the Department of Justice that court and sticking plasters are being investigated for germs of infectious diseases placed there by German agents will startle some of the rubber manufacturers whose product is of the plaster kind. A large business is also done in porous plasters and corn plasters, the basis of the adhesive compound being india rubber. This is often compounded with medicaments for a variety of beneficent purposes. Instead of curative compounds it would be quite possible to substitute poisons. Nor would those who put powdered glass in Red Cross bandages hesitate in such wanton devilishness were the opportunity to occur. So watch their steps.

SIAM DECLARES WAR.

The kingdom of Siam, at the northern end of the Malay Peninsula, which for the ten months ended April 19 shipped 13,456 pounds of Para rubber and 12,533 pounds of gutta percha through the port of Singapore, has declared that a state of war exists with Germany and Austria. Nine steamers, aggregating 109,000 tons, have been seized. All Germans and Austrians have been placed under arrest and their places of business closed. The object of Siam's declaration is to "uphold the sanctity of international rights against nations showing contempt for the principles of humanity and respect for small states."

BREAKING THE FREIGHT CAR SHORTAGE.

Realizing that any feasible means to relieve the present freight situation will prove of benefit to the government as well as to business in general, the Railway Business Association of New York is promoting a widespread campaign among the trade associations and leading business houses of the country to break car shortage. Model forms are being distributed which are now in successful use by several concerns and deserve wider adoption. These include a blank for the shipper's weekly inbound loading and detention record, and a circular to the shipping department to be signed by the president of the company and setting forth the aims and means as follows:

What we can do:

(a) Get fuller carloading. The limit is 10 per cent above stencilled weight capacity.

(b) Increase excess of credits over debits. Don't use all your free time; load or unload earliest possible moment.

How we can do it:

1. Install forms similar to the attached and keep for each car loaded or unloaded a record of performance.

2. Talk often with our employes about this patriotic opportunity.

3. Report to me monthly for conference showing comparison with previous month and with corresponding month a year ago where data are available. This comparison should show average weight of carload and average pounds short of full carload inbound and out-bound, total credits, total debits, and total demurrage, names of consignors who have habitually underloaded, names of consignees who order short carloads.

4. Write for cooperation of consignors in fuller carloading and consignees in ordering full carloads.

Rubber companies should be willing to lend a hand in this important movement.

A TRUCK TIRE TEST.

An important question at the present time is whether solid or pneumatic tires are better for army trucks in the severe service which is required of them under war conditions. A practical test was recently made by the United States Tire Co., New York City, which certainly shows that the pneumatic tires are efficient and will stand service under the most difficult conditions. A 1½-ton Packard truck, heavily loaded, in fact, overloaded, equipped with 36 by 7-inch U. S. Nobby Tread pneumatic cord tires, was sent from Detroit, Michigan, to the Mexican border at Mission, Texas, a distance of 2,037 miles, and returning by a different route, completed the run of 4,288 miles. The trip was in regions where good roads were unknown, frequently plowing through 12 to 14 inches of soft clay, and in other places roads of intermixed mud and sharp stones were encountered. The intense heat of the desert had no apparent effect on the casings which resisted the cutting stresses of sharp rocks and the impacts of rock-bottomed streams. The test was made under the supervision of First Lieutenant J. W. O'Mahoney, formerly a United States motor truck transport expert, who since he was mustered out of the Federal service has continued his study of army transportation. The test seems to prove that pneumatics have some advantages over solid tires for trucks in heavy service.

RECREATION TENTS FOR OUR SOLDIERS.

The Tucker Duck & Rubber Co., Fort Smith, Arkansas, has received a contract from the international committee of the Y. M. C. A. for $10,000 worth of tents, 40 by 80 feet, to be used in recreation places to be established for the benefit of American troops.

PRODUCTION OF ACETIC ACID IN CEYLON.

In view of the large quantities of acetic acid needed in the coagulation of latex, distillation experiments have been made with coconut shells and vera or virai wood. The results from the former were so satisfactory—the yield being 8 to 12 per cent of pure acetic acid, besides creosote, useful for smoked rubber—that many planters who grow both rubber and coconuts have installed small stills for distilling coconut shells and now produce all the acetic acid they need. Vera wood, the product of a shrub, yielded 4.14 per cent of pure acetic acid. The crude liquor could be utilized in the manufacture of smoked sheet or the darker rubbers; by redistilling it, after the addition of fresh charcoal, a pale yellow, clear solution of acetic acid was produced and could be employed for ordinary crêpe rubber. The erection of a small plant for the distillation of vera wood is being considered.

THAT RUBBER IS IN CERTAIN RESPECTS STRONGER THAN STEEL IS indicated by a unique test made at the Diamond tire factory. A sand blast under enormous pressure was blown on a piece of rubber and a piece of steel. The rubber actually outwore the steel three to one.

Bowers' Specific Gravity Tables.

THE determination of the weight of rubber articles is a matter of calculation well known to every rubber mill superintendent. It is upon these figures that factory costs are based and are therefore fundamental factors in the manufacture of mechanical rubber goods. According to the usual method the respective volumes of the articles to be produced are computed. Then the weight is determined for each article according to the specific gravity of the particular stock to be used in the goods. These determinations require a high order of technical as well as practical knowledge in the calculation of dependable figures. Moreover, the amount of time consumed is considerable, and human fallibility ever supplies the possibility of costly error in making complex computations.

A set of tables has been carefully designed to simplify the necessary calculations in determining the weights in ounces or pounds of rubber solids of regular dimensions, including disks, cylinders, square strips and sheets. As a short-cut method these tables will be of decided value to superintendents of rubber mills and by their use intelligent salesmen will be able promptly to answer customers' questions regarding the weight of a desired article.

The complete table with instructions, and several concrete examples of the method to be observed in computing the weights of disks and kindred articles are here shown. The tables for cylinders, square strips and sheets will be published in subsequent issues.

Various bases are used to reduce the number of decimals and still retain a true proportion throughout the table.

The stated base of the disk table is 62.40 pounds per cubic foot. The unit used is .000001731 ounce, equals a disk 1/64 in. diameter 1/64 in. thick—Specific gravity 1.00.

$$\frac{.000001731 \text{ ounce} \times (12 \times 64)^3}{.7853982 \times 16} = 62.40 \text{ pounds.}$$

Weight of one cubic foot of water— 39.1° F. (maximum density)—62.425 pounds. (Kent, 1916 edition, page 27.)

To convert disk table into weights according to above standard, multiply by 1.0004+ or divide by 0.99958+.

The disk table is constructed to read from 1/64 in diameter to 48 in. diameter (and above) as follows:

1/64 in. to 2 in. by 64ths in ounces
1/32 in. to 6 in. by 32nds in ounces
1/16 in. to 12 in. by 16ths in pounds
⅛ in. to 24 in. by 8ths in pounds
¼ in. to 48 in. by 4ths in pounds

The volumes of two similar solids are to each other as the cubes of their linear dimensions. (Kent, 1916 Edition, Page 62.)

1 1/64 in. / 2	= .007313475 ounce / 4		
2 1/32 in. / 2	= .029253900 ounce / 4		
4 1/16 in. / 2	= .117015600 ounce	=	.007313475 pound / 4
8⅛ in. / 2	=		.029253900 pound / 4
16¼ in.	=		.117015600 pound

The scope of the disk table is partly shown in the following examples that are intended to demonstrate the method employed when using the table which will be found on another page. The samples selected for computation include gaskets of two different sizes, a square flange ring, a valve, a washer, a ball valve and corks and plugs.

SAMPLE.

Gasket—45¼ in. diameter, 41 in. hole, 1/16 in. thick, Specific Gravity 1.62.

COMPUTATION.

45¼ in. / 4	= 11 5/16 in.	=	.056709291 pound
41 in. / 4	= 10¼ in.	=	.046556976
			.010152315 / 16
			60913890 / 10152315
45¼ in. x 41 in. x 1/64 in.		=	.162437040 / 8
			1.299496320 / 1.62
			2598992640 / 7796977920 / 1299496320
			2.10518403840 pounds, or 210½ pounds per 100.

SAMPLE.

Gasket—23⅛ in. diameter, 20 in. hole, 3/32 in. thick, Specific Gravity 1.68.

COMPUTATION.

23⅛ in. / 2	= 11 9/16 in.	=	.059243475 pound
20 in. / 2	= 10 in.	=	.044313600
			.014929875 / 4
			.059719500 / 6
23⅛ in. x 20 in. x 3/32 in.		=	.358317000 / 1.68
			2866536 / 2149902 / 358317
			.60197256 pound, or 60 pounds per 100.

SAMPLE.

Square Flange Ring—11½ in. diameter, 11 in. hole, ¼ in. square flange, Specific Gravity 1.71.

COMPUTATION.

11½ in.	=	=	.058604736 pound
11	=	=	.053619456
			.004985280 / 16
16/64	=		29911680 / 4985280
			.079764480 / 1.71
			79764480 / 558351360 / 79764480
			.13639726080 pound, or 13⅝ pounds per 100.

For round flange rings.—The use of 80 per cent of the weight of its circumscribing square flange ring will be found practical.

SAMPLE.

Valve—5¾ in. diameter, 5/8 in. thick, 11/16 in. hole, Specific Gravity 1.67.

COMPUTATION.

5¾ in.	=	=	.014651184 pound
11/16 in.	=	=	.000209451
			.014441733 / 40
40/64 in.	=		.577669320 / 1.67
			404368524 / 346601592 / 57766932
			.9647077644 pound, or 96½ pounds per 100.

APPROXIMATE WEIGHTS OF DISKS 1/64 INCH THICK

SPECIFIC GRAVITY 1.00

COMPUTED BY GEORGE W. BOWERS

Basis—Cubic Foot = 62.40 Lbs. Avd.

Diameter in Inches.	Pounds per Piece.		Diameters in Inches.	Pounds per Piece.		Diameters in Inches.	Pounds per Piece.	
	Ounces per Piece.	Diameters in Inches.		Ounces per Piece.	Diameters in Inches.		Ounces per Piece.	Diameters in Inches.
12	.063811584	3	8	.028360704	2	4	.G07090176	1
11 15/16	.063148611	2 63/64	7 15/16	.027919299	1 63/64	3 15/16	.006870339	63/64
11 7/8	.062489100	2 31/32	7 7/8	.027481356	1 31/32	3 7/8	.006653964	31/32
11 13/16	.061833051	2 61/64	7 13/16	.027046875	1 61/64	3 13/16	.006441051	61/64
11 3/4	.061180464	2 15/16	7 3/4	.026615856	1 15/16	3 3/4	.006231600	15/16
11 11/16	.060531339	2 59/64	7 11/16	.026188299	1 59/64	3 11/16	.006025611	59/64
11 5/8	.059885676	2 29/32	7 5/8	.025764204	1 29/32	3 5/8	.005823084	29/32
11 9/16	.059243475	2 57/64	7 9/16	.025343571	1 57/64	3 9/16	.005624019	57/64
11 1/2	.058604736	2 7/8	7 1/2	.024926400	1 7/8	3 1/2	.005428416	7/8
11 7/16	.057969459	2 55/64	7 7/16	.024512691	1 55/64	3 7/16	.005236275	55/64
11 3/8	.057372264	2 27/32	7 3/8	.024102444	1 27/32	3 3/8	.005047596	27/32
11 5/16	.056709291	2 53/64	7 5/16	.023695659	1 53/64	3 5/16	.004862379	53/64
11 1/4	.056084400	2 13/16	7 1/4	.023292336	1 13/16	3 1/4	.004680624	13/16
11 3/16	.055462971	2 51/64	7 3/16	.022892475	1 51/64	3 3/16	.004502331	51/64
11 1/8	.054845004	2 25/32	7 1/8	.022496076	1 25/32	3 1/8	.004227500	25/32
11 1/16	.054230479	2 49/64	7 1/16	.022103139	1 49/64	3 1/16	.004156131	49/64
11	.053619456	2 3/4	7	.021713664	1 3/4	3	.003988224	3/4
10 15/16	.053011875	2 47/64	6 15/16	.021327651	1 47/64	2 15/16	.003823779	47/64
10 7/8	.052407756	2 23/32	6 7/8	.020945100	1 23/32	2 7/8	.003662796	23/32
10 13/16	.051807099	2 45/64	6 13/16	.020566011	1 45/64	2 13/16	.003505275	45/64
10 3/4	.051209904	2 11/16	6 3/4	.020190384	1 11/16	2 3/4	.003351216	11/16
10 11/16	.050616171	2 43/64	6 11/16	.019818219	1 43/64	2 11/16	.003200619	43/64
10 5/8	.050025900	2 21/32	6 5/8	.019449516	1 21/32	2 5/8	.003053484	21/32
10 9/16	.049439091	2 41/64	6 9/16	.019084275	1 41/64	2 9/16	.002909811	41/64
10 1/2	.048855744	2 5/8	6 1/2	.018722496	1 5/8	2 1/2	.002769600	5/8
10 7/16	.048275859	2 39/64	6 7/16	.018364179	1 39/64	2 7/16	.002632851	39/64
10 3/8	.047699436	2 19/32	6 3/8	.010009324	1 19/32	2 3/8	.002499564	19/32
10 5/16	.047126475	2 37/64	6 5/16	.017657931	1 37/64	2 5/16	.002369739	37/64
10 1/4	.046556976	2 9/16	6 1/4	.017310000	1 9/16	2 1/4	.002243376	9/16
10 3/16	.045990939	2 35/64	6 3/16	.016965531	1 35/64	2 3/16	.002120475	35/64
10 1/8	.045428364	2 17/32	6 1/8	.016624524	1 17/32	2 1/8	.002001036	17/32
10 1/16	.044869251	2 33/64	6 1/16	.016286979	1 33/64	2 1/16	.001885059	33/64
10	.044313600	2 1/2	6	.015952896	1 1/2	2	.001772544	1/2
9 15/16	.043761411	2 31/64	5 15/16	.015622275	1 31/64	1 15/16	.001663491	31/64
9 7/8	.043212684	2 15/32	5 7/8	.015295116	1 15/32	1 7/8	.001557900	15/32
9 13/16	.042667419	2 29/64	5 13/16	.014971419	1 29/64	1 13/16	.001455771	29/64
9 3/4	.042125616	2 7/16	5 3/4	.014651184	1 7/16	1 3/4	.001357104	7/16
9 11/16	.041587275	2 27/64	5 11/16	.014334411	1 27/64	1 11/16	.001261899	27/64
9 5/8	.041052396	2 13/32	5 5/8	.014021100	1 13/32	1 5/8	.001170156	13/32
9 9/16	.040520979	2 25/64	5 9/16	.013711251	1 25/64	1 9/16	.001081875	25/64
9 1/2	.039993024	2 3/8	5 1/2	.013404864	1 3/8	1 1/2	.000997056	3/8
9 7/16	.039468531	2 23/64	5 7/16	.013101939	1 23/64	1 7/16	.000915699	23/64
9 3/8	.038947500	2 11/32	5 3/8	.012802476	1 11/32	1 3/8	.000837804	11/32
9 5/16	.038429931	2 21/64	5 5/16	.012506475	1 21/64	1 5/16	.000763371	21/64
9 1/4	.037915824	2 5/16	5 1/4	.012213976	1 5/16	1 1/4	.000692400	5/16
9 3/16	.037391331	2 19/64	5 3/16	.011924859	1 19/64	1 3/16	.000624891	19/64
9 1/8	.036897996	2 9/32	5 1/8	.011639244	1 9/32	1 1/8	.000560844	9/32
9 1/16	.036394275	2 17/64	5 1/16	.011357091	1 17/64	1 1/16	.000500259	17/64
9	.035894016	2 1/4	5	.011078400	1 1/4	1	.000443136	1/4
8 15/16	.035397219	2 15/64	4 15/16	.010803171	1 15/64	15/16	.000389475	15/64
8 7/8	.034903884	2 7/32	4 7/8	.010531404	1 7/32	7/8	.000339276	7/32
8 13/16	.034414011	2 13/64	4 13/16	.010263099	1 13/64	13/16	.000292539	13/64
8 3/4	.033927600	2 3/16	4 3/4	.009998256	1 3/16	3/4	.000249264	3/16
8 11/16	.033444651	2 11/64	4 11/16	.009736875	1 11/64	11/16	.000209451	11/64
8 5/8	.032965164	2 5/32	4 5/8	.009478956	1 5/32	5/8	.000173100	5/32
8 9/16	.032489139	2 9/64	4 9/16	.009224499	1 9/64	9/16	.000140211	9/64
8 1/2	.032016576	2 1/8	4 1/2	.008973504	1 1/8	1/2	.000110784	1/8
8 7/16	.031547475	2 7/64	4 7/16	.008725971	1 7/64	7/16	.000084819	7/64
8 3/8	.031081836	2 3/32	4 3/8	.008481900	1 3/32	3/8	.000062316	3/32
8 5/16	.030619659	2 5/64	4 5/16	.008241291	1 5/64	5/16	.000043275	5/64
8 1/4	.030160944	2 1/16	4 1/4	.008004144	1 1/16	1/4	.000027696	1/16
8 3/16	.029705691	2 3/64	4 3/16	.007770459	1 3/64	3/16	.000015579	3/64
8 1/8	.029253900	2 1/32	4 1/8	.007540236	1 1/32	1/8	.000006924	1/32
8 1/16	.028805571	2 1/64	4 1/16	.007313475	1 1/64	1/16	.000001731	1/64

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SAMPLE.

Washer—¾ in. diameter, 3/64 in. hole, 1/16 in. thick, Specific Gravity 1.78.

COMPUTATION.

¾ in.	=	.000997056 ounce
3/64 in.	=	.000015579
		.000981477
		4
¾ in. x 3/16 in. x 1/16 in.	=	.003925908
		1.78
		31407264
		27481356
		3925908
		.00698811624 ounce, or 7 ounces per 1000.

Ball Valves.—The volume of a sphere is equal to 2/3 of the volume of its circumscribing cylinder. (Kent, 1916 Edition, Page 62.)

SAMPLE.

Ball Valve—1 1/64 in. diameter, Specific Gravity 1.58.

COMPUTATION.

1 1/64 in.	=	.007313475 ounce
		65
		36567375
		43880850
		3) .475375875
		158458625
		.316917250
		1.58
		2535338000
		1584586250
		316917250
		.50072925500 ounce, or ½ ounce each.

Corks, Plugs, etc.—To find the volume of a frustrum of a cone—add together the areas of the two bases and a mean proportional between them, and multiply the sum by one-third of the altitude. (Kent, 1916 Edition, page 62.)

SAMPLES.

Corks or Plugs—3 in. top diameter, 2 in. bottom diameter, 2¼ in. long, ⅝ in. hole, Specific Gravity 1.58.

COMPUTATION.

3 in.	=	.003988224 pound
2 in.	=	.001772544
2¼ in.	=	.002769600
		3) .008530368
		.002843456
⅝ in. hole	=	.000173100
		.002670356
2¼ in = 176/64 in	=	176
		16022136
		18692492
		2670356
		.469982656
		1.58
		3759861248
		2349913280
		469982656
		.74257259648 pound, or 74½ pounds per 100.

REDUCING THE LABOR TURNOVER.

"New Men for Old, the Hiring and Firing Problem in Industry," is the title of an article by Lillian Erskine and Treadwell Cleveland, Jr., in "Everybody's Magazine," and reprinted for distribution by the Chamber of Commerce of the United States of America, that merits the attention of every employer, especially at this time when the war has forced the great cost of the labor turnover into prominence. Never has there been a better exposition of the cost of this turnover in instruction, damage to equipment, lowered production and spoiled work, nor of where the blame rests. A convincing case is argued for the fact that the real product of a factory is not materials but men, and 16 essentials are stated for standardizing the turnover and reducing it to the minimum. A study of the means advocated as tending toward the elimination of this costly economic and social waste indicates that leading American rubber industries have already adopted many of them with gratifying results.

RUBBER HEELS AT THE SHOE FINDERS' CONVENTION.

THE National Leather & Shoe Finders' Association held its regular convention at Milwaukee, Wisconsin, July 10, 11 and 12. A portion of its session included a meeting of the Rubber Heel Club of America, which is composed of manufacturers of rubber heels and soles, the special purpose of this club being to bring about a spirit of cooperation among these manufacturers and to further the sale and use of rubber in place of sole leather.

Robert H. Cory, of the O'Sullivan Rubber Co., New York City, president of the Rubber Heel Club, stated that it is estimated that 10 per cent of the residents of New York City wear rubber heels. Allowing for the consumption of three pairs of heels per year per wearer, and applying these figures to the population of the country at large, disclosed the possibilities of merchandising 30,000,000 pairs of rubber heels annually through the country.

George A. Stetson, of the Elastic Tip Co., Boston, Massachusetts, the secretary of the club, reported that a great deal has been accomplished in promoting amicable relations between the members of the club and the Finders' Association and that he felt certain that as the work of both bodies became better understood, greater progress would be made in the future.

C. H. Oakley, of the Essex Rubber Co., Trenton, New Jersey, a director of the Rubber Heel Club, stated that the relations between the rubber heel and shoe finders' organizations had been established on a most satisfactory basis. The members of the Rubber Heel Club met several times during the year and the result has been that relationships have been established so that three-quarters of all the manufacturers of rubber heels discuss their trade problems with the utmost freedom and candor. He said that only by the elimination of wasteful manufacturing and foolish business methods can it be possible for merchandise of acceptable quality to reach the consumer with a fair margin of profit to all parties concerned in the trade.

During the convention the following resolution was passed by the National Leather & Shoe Finders' Association:

Resolved: That the National Leather and Shoe Finders' Association endorses and approves of the organization purposes and methods of the Rubber Heel Club of America and urges co-operation with its efforts to create and extend the use of rubber heels and to further the mutual interests of manufacturers, distributers and users of rubber heels.

An important action at this convention was the appointment of an educational committee and the raising of a sum of over $20,000 for an educational campaign, to be carried into effect by an educational director to be appointed by this committee.

A feature of the convention was the address of Frank W. Whitcher, a leading Boston shoe findings manufacturer and jobber, and proprietor of the Velvet rubber heels, whose analysis of the present trade situation was very thorough, and instructive. Mr. Whitcher is an ex-president of the Finders' Association and for several years held the office of treasurer, resigning at this session because of the pressure of his duties in connection with the National Chamber of Commerce.

VENTILATED RUBBER COATS?

NOW it is an acid-proof textile fabric that is wanted; this to be used for the clothing of workmen employed in chemical plants producing, or using, acids. Cotton and other vegetable fibers are useless, and wool fabrics disintegrate very quickly. Rubber effectively resists the strongest mineral acids, but rubber suits are not comfortable and rubber is therefore used only for gloves and boots. Perhaps a wool cloth impregnated with rubber in such a manner as to render it sufficiently pliable, and yet wear-resisting, may be developed. [Textile World Journal.]

What the Rubber Chemists Are Doing.

SYNTHETIC RUBBER.

IN a comprehensive article in "Metallurgical and Chemical Engineering" (May 1, 1917), Andrew H. King illustrates the possibilities should synthetic rubber be obtainable commercially, by comparison with the case of synthetic indigo, which has completely displaced indigo from natural sources.

The present state of knowledge on the structure of the caoutchouc molecule is given in historical review, following by formulas, discussions of polymerization, methods of preparation of butadiene, condensation, opening the benzene ring, fermentation and dehydration.

This is the concluding article of a series of three, the object of which is to point out that if the seas are ever closed for the importation of our rubber supply there are only three ways to protect ourselves.

1. Cultivate and harvest guayule by scientific methods.
2. Develop something from milk weed or related plants.
3. Work up a good synthetic rubber.

METHODS FOR TESTS OF CHICLE.

The following methods by Dr. Frederic Dannerth are condensed from "The Journal of Industrial and Engineering Chemistry" (July, 1917).

Chicle is valued on the basis of the following factors: (1) Contained moisture; (2) shrinkage, when cleaned of dirt and bark; (3) chewing quality of purified chicle; (4) color of the crude chicle.

Typical analysis of Yucatan chicle:

	Per Cent
Acetone-soluble matter (resins)	40.0
Gutta and carbohydrates	17.4
Proteins	0.6
Sand and foreign matter	2.3
Water	35.0
Mineral matter (ash)	4.7

Crude chicle is sampled by cutting one pound from the block. This is rapidly cut into half-inch crumbs and stored for test sealed in a "Lightning Jar." Wet chicle cannot be thus stored more than one week, as molds grow rapidly, especially in the dark.

MOISTURE.

A half grain of crude chicle is dried in an air bath about five hours and not exceeding 50 degrees C. A glass dish two or three inches in diameter with ground glass lid is used for the sample. Fusion retards evaporation of the water. Drying is complete when two consecutive weighings agree within one-half per cent.

Moisture in crude chicle may be determined simultaneously with the resins. Boiling acetone removes resins and water from the sample. The extract in the flask is dried at 105 degrees C. and the residue in the thimble is dried in a similar manner. The sum of these weights subtracted from the weight of the original sample represents water. This method for determining moisture is preferred in practice.

VISCOSITY.

Kerosene (boiling point above 140 degrees C.) is used as the solvent as the loss by evaporation is negligible. Commercial chicle must be dried for 12 hours in a vacuum at not exceeding 70 degrees C. before solution.

Twenty grams of dry chicle, weighed to tenths of a gram, are placed in a wire basket fitted for a "Joint Rubber Committee" extraction apparatus. In the flask are placed 75 cc. of kerosene. The basket is made of 100-mesh wire gauze and retains any gritty and fibrous matter. The kerosene-chicle solution is diluted with kerosene to a concentration of 20 grams of strained chicle in 100 cc. of liquid. After cooling to 20 degrees C. its viscosity is determined in a Stormer viscosimeter (THE INDIA RUBBER WORLD, December 1, 1916) and the result expressed in revolutions per minute.

RESINS.

The chewing quality of chicle is due to the presence of resins of suitable melting point. Mexican chicle has resin contents averaging 60.8 per cent of the dry chicle.

ACETONE SOLUBLE MATTER. Five grams of crude chicle, granulated to pass through one-eighth mesh screen, is extracted five hours in a Joint Rubber Committee extractor with acetone of boiling point not higher than 65 degrees C. The evaporated extract is dried to constant weight at a temperature not above 105 degrees C., cooled in a desiccator and weighed. The residue is dried at 85 degrees C. If the acetone solution is allowed to cool before distillation a large part of the resins separate out as a wax-like incrustation. After all the acetone is expelled and the temperature reaches 105 degrees C. the residual resins appear quite clear and amber colored.

MINERAL MATTER.

One to two grams of dry chicle are incinerated in a crucible inserted in an asbestos shield. The organic matter is volatilized at low temperature without ignition, after which the carbon is burned off as usual.

COLORED SPOTS ON RAW RUBBER.

B. J. Eaton, in the Agricultural Bulletin of the Federated Malay States, discusses the development of chromogenic organisms in dry rubber allowed to become damp. The colored spots referred to are designated as "spot disease" and have been determined experimentally to be due to the growth of chromogenic organisms induced by either rain or sea water wetting. Ten days after wetting dry, clean pale crêpe considerable development of colored organisms occurred, resulting in patches of orange, blue and yellow on the rubber. Dry, well-smoked sheet rubber may develop mildew on the surface for similar reasons, while low-grade rubbers may ferment and become tacky.

The author notes several interesting observations in the course of his investigations on the development of chromogenic organisms in rubber. No development of pigment occurs in "slab" rubber, which is slightly pressed coagulum, until the slab is cut open, when pigment develops on the cut surface after a few days. If sheet rubber is rolled into a cylinder straight from the sheeting machine, no development of pigment takes place until the sheet is cut open, when pigment develops on the cut surface. When wet, thin crêpe is rolled into a cylinder there is invariably a great production of pigment due to the growth of these organisms. From these experiments it seems that the presence of air is necessary for the development of chromogenic organisms, and this is excluded in rolled sheet or slab rubber. Also it is probable that an excess of moisture may retard or prevent the formation of the pigment, and that the pigment forms later with the reduction of the moisture.

VALUATION TESTS OF CRUDE RUBBER.

Scientific and rule-of-thumb valuing of plantation rubber have recently been compared by J. G. Fol for the Dutch Rubber Congress. The report of the investigation is published in the report of Department of Agriculture, Manufactures and Commerce, under the title of "Mededeelingen van dem Rijksvoorlichtingsdienst ten behoeve van den Rubberhandel en de Rubbernijverheid te Delft." There were 137 specimens, 36 samples of sheet, all but one of which were smoked, and 101 samples of crêpe, six of which were thick blanket. These were all judged in an empiric way by the producers and their conclusions reserved and com-

pared after completion of the scientific tests made without knowledge of the first results.

Empiric judging of rubber depends largely on color, smell and stretch. These tests at best are only roughly approximate, although the rubber expert by means of them can distinguish marked differences in quality. It is a mistake to presuppose that mechanical properties of the rubber when vulcanized run parallel to color, smell and stretch in the raw state. Variations in physical condition do not permit hand pulled tests nor quantitative expression of value. The influence of temperature variations are also marked.

Smoked sheet cannot be judged better by rule of thumb than crêpe. Its color denotes only the degree of smoking. Sheet is easier judged as to its mechanical properties than crêpe.

Black rubber presents the most difficulties for empiric judgment as it cannot be subjected to a hand test.

Scientific methods obviate these objections because each sample is suitably prepared and tested quantitatively. The 137 samples under investigation were examined after the following scheme:

A. CHEMICAL ANALYSIS:
1. Moisture.
2. Resin.
3. Ash.
4. Nitrogen calculated as albumen.
5. Rubber.
6. Acetic degree.

B. VISCOSITY NUMBER.

C. VULCANIZATION AND PHYSICAL TESTS:
1. Tensile strength.
2. Elongation.
3. Permanent set after 24 hours at 400 per cent stretch measured after six hours' rest.
4. Temporary set measured directly after release from 400 per cent stretch.
5. Determination of load necessary to stretch sample 400 per cent (kilograms per square centimeter).
6. Difference of the load necessary to stretch sample 400 per cent and that required for the last of five successive 400 per cent stretchings.
7. Elasticity or rebound.
8. Coefficient of vulcanization.

Concerning the importance and correlation of these determinations, it is concluded: (1) Chemical analysis is not sufficient alone for judgment of the rubber quality. Properties of rubber are chiefly determined by the physical nature of rubber and the rubber molecule. The quantitative chemical differences are not enough to account for the large differences found in the physical properties; (2) in general a high viscosity indicates good mechanical properties of the rubber after vulcanization. However, the opposite must be assumed with some reservation, since in studying the relation between the viscosity and tensile strength it appeared that various samples with a low viscosity had a very high tensile strength. The samples that exhibited this relation were almost exclusively smoked sheet. This phenomenon is caused by the fact that it is very difficult to dissolve smoked sheet in benzol completely. The dissolved part has a low viscosity and presumably contributes little to the excellent qualities shown by the sample after vulcanization, while the very considerable amount of undissolved rubber apparently is the most valuable part of the sample and most probably causes the good properties after vulcanization.

The *Voorlichtingsdienst* (Information Service) has taken the position that rubber which possesses good mechanical properties under certain normal vulcanization conditions, is better than that which may show these good properties only after prolonged vulcanization. It thus had to base judgment of the samples sent in on a determination of the mechanical qualities and of the coefficient of vulcanization of the rubber vulcanized according to a standard method.

Test samples for vulcanization were prepared with seven and one-half per cent of sulphur and were vulcanized one and one-half hours at three and one-half atmospheres.

The tensile strength, permanent set after stretching 400 per cent and the coefficient of vulcanization were taken as quantities suitable for classifying the samples. These quantities are closely related. Thus, high tensile strength generally accompanies high coefficient of vulcanization and low permanent set. Elongation at break also indicates the quality of the rubber; of samples equally loaded, that is, the best which has the highest elongation at break.

The remainder of the physical tests made were set aside as practically valueless for the end in view.

One of the most important points demonstrated by this investigation is the lack of uniformity in First latex rubber. The greatest divergencies were found in viscosity, tensile strength, permanent set and the coefficient of vulcanization. The causes of this lack of uniformity and its prevention is one of the most important problems of the rubber industry.

The rubbers investigated were classified as follows:

Class.	Breaking strain (kilograms per sq. c. m.)	Permanent set.	Coefficient of vulcanization.
I	135 k. g. and over	Maximum 5%	Minimum 5
II	120 k. g. to 135 k. g.	5% to 7%	Minimum 4
III	90 k. g. to 120 k. g.	7% to 12%	Minimum 3
IV	80 k. g. to 90 k. g.	Over 12%	Below 3
V	Below 80 k. g.	Over 12%	Below 3

The division of the 137 samples among the different classes is indicated below:

Class.	Sheet.	Crêpe.	Blanket.
I	17*	3	0
II	12	21	3
III	7	51	2
IV	0	11	1
V	0	9	0
Totals	36	95	6

* One sample unsmoked.

These figures demonstrate clearly that, in general, smoked sheet is better than crêpe. However, there are samples of crêpe that are equal to smoked sheet as far as mechanical properties are concerned. The number of samples of blanket is too small to permit a decisive conclusion but the figures would indicate that blanket is inferior in quality to smoked sheet and often also to crêpe.

The empiric judgment of the rubbers by the contributors varied considerably in method. Seven contributors only, out of 15, sent in their judgment. Some arranged the rubbers in groups, others graded them and one sent the market values. From the last method it is seen that according to the prevailing system inferior crêpe is valued as highly as the best crêpe.

Lack of uniformity in plantation rubbers reveals itself chiefly in the difference in rapidity of vulcanization. Two rubbers outwardly of absolutely equal value may produce entirely different results after vulcanization. Empiric judgment cannot tell how a rubber will behave during vulcanization, hence the estimate of value is liable to be incorrect. This causes much uncertainty and disappointment to the manufacturer.

Another disadvantage which will be removed by the introduction of scientific methods of inspection is the putting together of equal lots of rubber coming from different plantations and possessing widely divergent properties.

The main advantages of the scientific system of grading rubber will be, (1) relatively better prices, especially of classes II and III, in comparison with those of hard fine Para; (2) improvement of the product of a good many estates, the managers of which grope in the dark at present; (3) increased use of plantation rubber, certain qualities of which are already as good, if not better than hard fine Para.

INFLUENCE OF PIGMENTS ON RUBBER.

In an article on pigments in rubber ("Journal of Industrial and Engineering Chemistry," July, 1917) Dr. Maximilian Toch states the nature and chemical effects on rubber of active compounding ingredients or "reinforcing pigments," such as antimony sul-

phide, litharge, sublimed zinc, lead, zinc oxide, lithopone, precipitated barium sulphate, carbon blacks and a few other well-known materials.

RUBBER IN AIR BRAKE AND SIGNAL HOSE.

The Master Car Builders' Association specifications for air brake and signal base prescribe standard methods of test and maximum and minimum test requirements as follows:

FRICTION.

The quality of friction rubber must be such that a 20-pound weight will not separate the duck plies of a one-inch wide section of hose more than eight inches in ten minutes.

TUBE AND COVER.

STRETCH. Specimen one-half inch wide, gage marks two inches, is stretched twice to 800 per cent, re-marking two inches between stretchings and held stretched ten minutes the second time. After this treatment the rubber may show not over one-quarter inch temporary set and one-eighth inch permanent set between gage marks.

TENSILE STRENGTH. Specimen one-half inch, gage marks two inches. Breaking strength, minimum 800 pounds; maximum, 1,200 pounds per square inch.

METHOD OF ANALYSIS.

ESTIMATION OF MINERAL MATTER IN VULCANIZED RUBBER.

TWO grams of the sample are placed in a 300 cc. flat-bottom flask and covered with 50 cc. nitro-benzene. Connect the flask with a reflux air condenser (Hopkins preferred). Heat the flask until the rubber is completely dissolved, then allow the apparatus to cool. Dilute the contents with acetone, constantly stirring with a glass rod. Let stand for at least one hour to precipitate all mineral matter out of solution. Decant and transfer all to a filter paper and wash with acetone, then with alcohol. After a slight wash with water, dry at a low heat, weigh and calculate the percentage of mineral matter in the two grams of sample. The above method is by A. W. Jones, Jr., in "The Chemist-Analyst" (January, 1917).

CHEMICAL PATENTS.

THE UNITED STATES.

RUBBER VULCANIZING PROCESS. Adding to a mixture of rubber and sulphur, as an accelerating substance, a base of the aromatic series in which the anilin function or radical is in position para, with another radical or with the atom of carbon or triphenylmethane, and heating. [Etienne de Meeus, Beacon Falls, Connecticut, assigner to Beacon Falls Rubber Shoe Co., Boston, Massachusetts. United States Patent No. 1,229,724.]

LIQUID RUBBER COATING COMPOSITION. A liquid coating composition comprising Para rubber, gasoline, petroleum, oil of turpentine, linseed oil, China wood oil, white lead, red lead, sulphate of zinc and lead acetate. [Siegmund Jacobs, assignor of one-third to Charles Petrasek, both of Cicero, Illinois. United States Patent No. 1,229,964.]

WATERPROOF COATING. A waterproofing composition comprising a mixture of asphalt, carnauba wax, ceresin, aluminum oleate and castor oil dissolved in or softened by a volatile solvent combined with a filler of finely divided Portland cement. [William H. Adams, Kenyon, Rhode Island. United States patent No. 1,231,687.]

WATERPROOF FILLER. A liquid waterproofing filler comprising in a combined mixture of forty-five parts, rubber cement, 4½ parts; paraffin wax, 1½ parts; turpentine, 2 parts; varnish makers' naphtha, 35 parts, and tri-chlorethylene, 2 parts. [Lewis A. Coleman, assignor to American Chemical & Manufacturing Co.—both of Norfolk, Virginia. United States patent No. 1,233,190.]

THE UNITED KINGDOM.

GUTTA PERCHA AND RUBBER SUBMARINE CABLES. Submarine telephone cables are insulated by gutta percha which has been partly or wholly deresinated and mixed with natural india rubber or its synthetic substitutes. [Felten & Guilleaume Carlswerk Akt.-Ges., 24 Schangenstrasse, Mulheim-on-Rhine, Germany. British patent No. 105,573 (1917).]

VULCANIZING INDIA RUBBER. India rubber and its compounds and oil substitutes are vulcanized by means of finely ground oil shale. The sulphur in the shale acts as a vulcanizing agent, the hydrocarbons improve the product, and the siliceous matter acts as a filler. [G. E. Heyl, King's House, Kingsway, London. British patent No. 105,831 (1917).]

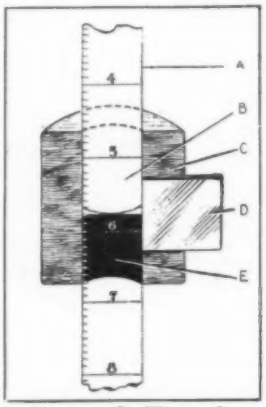
SWEDEN.

CAOUTCHOUC FROM BEARBERRY SHRUB (*Arctostaphylus uva-ursi*). The shrub is first extracted with water to remove tannin, dried and the caoutchouc removed by solution in benzene, ether, carbon bisulphide or other solvent and precipitated. [E. W. Tillburg, Swedish patent No. 42,227 (March 21, 1917).]

LABORATORY APPARATUS

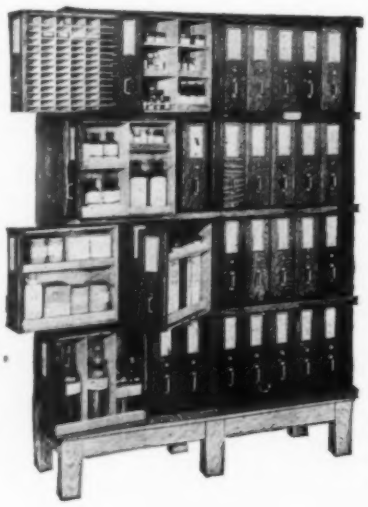
DEVICE FOR BURETTE READING.

A SIMPLE and easily made device for use in reading burettes is that originated by C. B. Clark, chemist of the Somerset Rubber Reclaiming Works. It is made in the form of a short half-cylinder of wood grooved to fit an ordinary burette. One half the groove is lined with white glazed paper and the other half with black glazed paper. A flat mirror, about three-quarters of an inch square, is set flush into one edge of the flat side, and is spaced equally with relation to the black and white lining of the burette groove. The method of use is indicated in the cut. The white section is applied against dark solutions and the black against light ones. The function of the mirror is to reflect light on the meniscus and graduations, thus rendering the reading of the scale very accurate, which is a very difficult matter in certain instances.



A—BURETTE; B—WHITE GLAZED PAPER; C—WOOD BLOCK; D—MIRROR; E—BLACK GLAZED PAPER.

FILING CABINET.

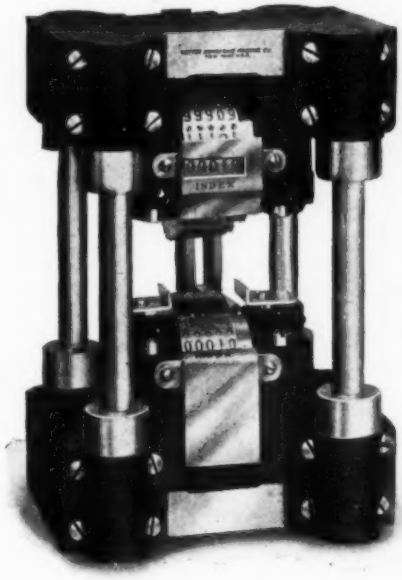


A very useful and convenient laboratory cabinet or filing system for chemicals, specimens and test pieces, known as the Schwartz Sectional System, is here illustrated. This arrangement keeps the materials filed in perfect condition, in a third of the usual shelf space. The contents of the cabinet are listed in a loose leaf index, reference to which instantly locates the chemicals or samples desired. [Indianapolis Drug Cabinet Co., Indianapolis, Indiana.]

New Machines and Appliances.

MACHINE FOR STAMPING NUMBERS ON METAL.

THE difficulty of obtaining metal specialties of various sorts, due to the congestion of orders in the metal industry, has been a serious handicap to many rubber mills. When the necessity is urgent the manufacturers have been forced to supply their own requirements that were formerly obtained from makers of metal specialties.



As a case in point, the thin strip of tin or aluminum that is numbered consecutively and used in the molds for reproducing the number of the tire, may be made by the machine here shown. It is constructed on the same lines as a sub-press and is used in connection with an ordinary power punch press. This machine will automatically emboss consecutive numbers on thin, soft metal, either on separate pieces or from a roll.

The numbering wheels are constructed on the principle of male and female dies and as the strip is automatically fed between them a raised number is formed on the metal at each stroke of the press. The numbering heads may also be constructed with any number of wheels and a letter wheel to follow or precede the number is supplied if so desired. Moreover, the machine can be constructed to duplicate or triplicate each number. [Wetter Numbering Machine Co., 255-61 Classon avenue, Brooklyn, New York.]

THE DOUBLE CONE VISE COUPLING.

The old-fashioned flange coupling is now seldom used, as it requires particular fitting to its individual shaft, must be tightly forced in place permanently and cannot be used on shafts in connection with other than split pulleys or open hangers. The modern type of compression coupling that possesses none of these objectionable features is here shown and has been specially designed to meet the particular requirements of rubber mill practice.

There are three principal parts—the outer sleeve or shell and two inner bushings or cones. The shell has its interior surfaces bored like the frustrums of two cones, having one continued axis. Into these are fitted the two cones, which have been previously bored of standard size to suit the shafts. When in place the axes of the cones must be coincident with that of the shell, thus under all conditions keeping the two shafts that are connected in true axial line, an exclusive feature of this coupling. The inner ends of the cones do not come together, their relative position being regulated by their external contact with the inner surface of the shell and their internal pressure upon the shafts to be coupled.

The shells have three equidistant longitudinal slots in their inner surface, while the cones have corresponding slots in their outer surface, through the bottom of which there is cut a narrow additional slot, which extends through to the bore, thus

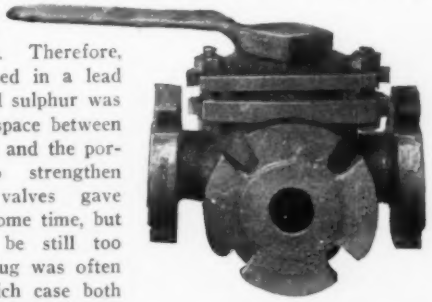
parting the cone on this side. Into these main slots are pocketed the bolts, which serve alike to draw the cones toward each other and to prevent their turning in place.

The attachment and operation are readily understood. When the various parts have been placed—by hand—in proper position on the shafts, the bolts are inserted and gradually tightened. This screwing of the bolts exerts an equal pressure upon both cones, and as they are drawn along the inclined walls of the shells they are compressed, and exert a vise-like grip upon the entire circumference of the shafts to be coupled. As a slight drawing of the cone within the shell will make a perceptible compression of its diameter, and a subsequent contraction of its bore, it is evident that the shafts do not require to be fitted to the couplings, and that variation in the exact sizes of the shafts does not distort their true alinement.

When the cones or their key seats become worn, the substitution of new cones renders the coupling practically new in every respect. [William Sellers Co., Inc., Philadelphia, Pennsylvania.]

ACID PROOF VALVES.

In the early days of the rubber reclaiming industry porcelain cocks were used on the acid lines in place of valves. These being exceedingly fragile it was necessary to provide some sort of covering to protect the porcelain against breakage. Therefore, they were enclosed in a lead casing and melted sulphur was poured into the space between the lead envelope and the porcelain cock to strengthen them. These valves gave satisfaction for some time, but were found to be still too fragile, as the plug was often fractured, in which case both plug and seat had to be replaced at considerable expense.

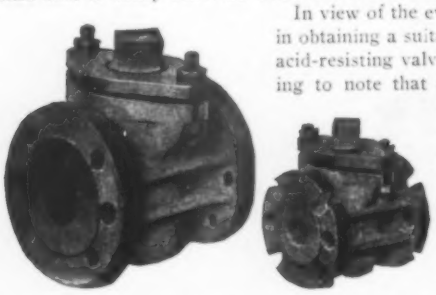


A trial was then made with the regular type of cast iron cock. This proved to be satisfactory for a while, but eventually the plug became stuck or "frozen" in the valve body owing to the corrosive action of the acids.

Valves that comprised a metal body lined with special acid-

resisting metal of the nature of lead were not altogether satisfactory, due to the difficulty of keeping the seat tight and the frequent trouble occasioned by the stem sticking in the body of the valve.

Fairly satisfactory results have been obtained by using the ordinary ammonia valve in which the steel disk usually furnished with these valves is substituted by a disk filled with soft lead that is easily renewed when it becomes worn and leaky.



In view of the evident difficulties in obtaining a suitable material for acid-resisting valves, it is interesting to note that a comparatively new alloy has been used with great success for this purpose. It is known as "Duriron," and is claimed to be impervious to the action of nitric, sulphuric, acetic and many other acids in all degrees of dilution.

Prior to the advent of Duriron—about five years ago—there was no single metal from which acid valves and other chemical apparatus could be made which would resist corrosive and erosive action. Duriron is a hard, close-grained metal having a particularly uniform quality, taking a fine finish, and being practically non-corrodible. Valve seats made of it will hold their original condition of tightness for an indefinite length of time.

In many cases plug cocks possess advantages over valves, because they are quick and simple to operate. The main objection to this liability to stick or "freeze" has been overcome by plug cocks made of this metal, as experience has proven that they seldom if ever stick.

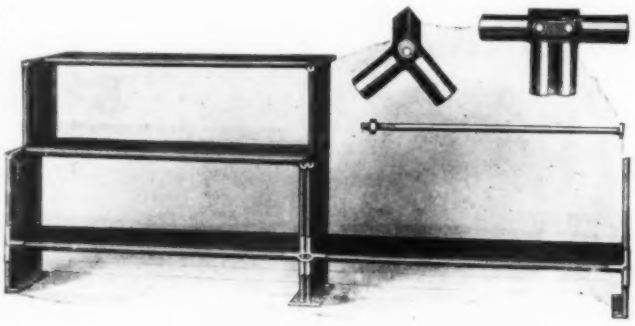
Duriron is employed in the form of castings, and on account of its exceeding hardness, its finished surfaces are machined by grinding. Many useful implements, utensils, pumps, containers, etc., are made of this material. [Duriron Castings Co., Dayton, Ohio.]

SECTIONAL STEEL SHELVING.

During the past few years there has been a growing demand for strong, interchangeable and portable shelving suitable for use in the office or plant of a rubber mill. Wooden shelving has failed to be generally accepted and therefore the development in this material has been slow. Sectional steel shelving of unit

construction that is sold at a comparatively moderate price has proved very satisfactory for both office and factory use.

This shelving, known as "Multi-Unit" shelving, is built of extra heavy sheet steel with the idea of making it available for heavy duty service in factories and in places where the shelving would receive more or less rough usage. It can be arranged in sections by the multiplication of any number of units. All of the units solidly interlock and all parts are interchangeable which allows the greatest variety of arrangement. Another feature is that the



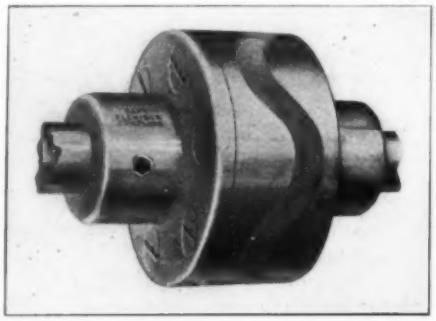
shelves and uprights have tubular edges, which serve not only to add to its strength but give it a very attractive appearance, especially when it is finished in the colored enamels.

The shelving is supplied in plain steel so that it can be painted at will, or it is furnished in a finish of black or olive green enamel. The uprights have paneled sides and the shelving is furnished with paneled backs, when backs are desired.

At the present time the units are furnished in standard size, 36 inches long, 12 inches high and 12 inches wide, and the standard stack, which is being put out at present, is five shelves high, but this can be arranged in any way to suit the purchaser's convenience. [National Scale Co., Chicopee Falls, Massachusetts.]

THE DAFT FLEXIBLE COUPLING.

There are many installations of machinery in rubber and other mills where the solution of the power transmission problem requires a flexible coupling. This is particularly true in connecting up generators, either to direct drives from counter shafts or in motor generator sets where a flexible connection is necessary to allow the armature to float in its true field. Also, on the mill line where sudden shocks are of such frequent occurrence and errors of alinement often occur, some sort of flexible coupling is considered indispensable. Applied to calenders, the torque is rendered uniform and backlash effectively precluded by a flexible element provided on the drive shaft.

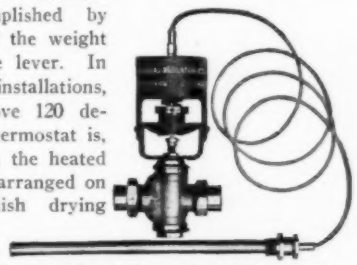


The Daft coupling here shown is of particular interest, due to the fact that its flexibility and driving power depend on a specially compounded rubber medium of novel form. Two types of this coupling are made; one is articulated to permit installing without disarranging the line, and the other is of the integral or solid type. The dielectric property of the rubber connection used in these couplings affords perfect insulation when they are used in connection with direct driven motors or generators. [Rubber Insulated Metals Corporation, Plainfield, New Jersey.]

POWERS' TEMPERATURE REGULATORS.

The control of temperature is a vital necessity in the manufacture of dependable rubber goods. The maintenance of the required degree of heat during the period of vulcanization determines the effectiveness of the cure and depends in a great measure on the automatic devices used for controlling vulvanizing temperatures. Also in steam heated dry rooms for drying crude rubber, compounding ingredients, and varnished rubber goods, temperature regulations are indispensable.

A type of temperature control that is recommended for these purposes is here shown. The thermostat, or sensitive bulb, is arranged in the heated space and transmits the changing vapor pressures through a flexible armored tube to a metallic diaphragm located in the bonnet of the steam valve. The expansion and contraction of the bellows opens or closes the valve, thereby regulating the supply of steam to the heater or dry room. Adjustment for different temperatures is accomplished by changing the position of the weight that slides on the valve lever. In vulcanizer and dry room installations, where temperatures above 120 degrees F. are used, the thermostat is, of course, located within the heated space while the valve is arranged on the outside. In varnish drying rooms where a temperature of 120 degrees F. or less is to be maintained, the valve is located within the room.

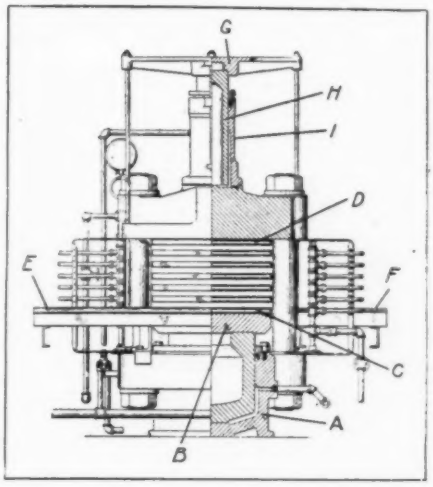


Where it is necessary for any purpose to maintain a certain degree of humidity, the regulator shown in the lower illustration and designed for the control of liquid temperatures, is used. The thermostat in this case, however, is immersed in the heated water tank and transmits the changes in pressure to the metallic diaphragm that opens and closes the steam valve, thereby regulating the water temperature. [The Powers Regulator Co., 5 South Wabash avenue, Chicago, Illinois.]

MACHINERY PATENTS.

GAMMETER'S VULCANIZING PRESS.

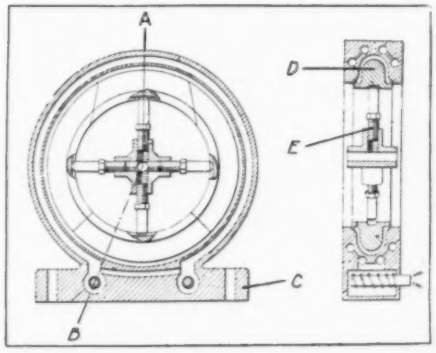
THE prime object of this invention is to provide a mechanically operated elevator whereby the loading and unloading of molds used in the manufacture of mechanical rubber goods is greatly facilitated. The illustration, representing a side elevation of the machine partly in section, comprises the hydraulic cylinder *A* forming the base in which operates a ram that supports the movable platen *B* on its upper end. Seven hot plates are provided, the lower one shown at *C* resting on the lower platen while the uppermost plate *D* is attached to the upper platen. The intermediate plates have varying degrees of vertical movement and are provided with means for stopping the plates at predetermined distances from each other to permit the insertion and withdrawal of the molds. All the hot plates are chambered for steam and connected to the supply line by flexible joints. On opposite sides of the press are two elevator platforms, *E* and *F*, suspended by four vertical rods from the yoke *G* that is fixed to the ram *H*, which reciprocates in the cylinder *I* mounted on the head of the press.



The press is opened by discharging the lower cylinder and the ram descends, thus opening the mold compartment. The press is then charged with the full complement of molds and pressure applied during the vulcanizing period. When the molds are to be changed this may be effected with the aid of the elevators and by the operator on one side pushing an uncured mold into the compartment, thereby forcing out a cured mold onto the opposite platform. The molds may also be cured in pairs with overlapping curing periods, only two of the molds being changed at one time and the others remaining in the opened press, the substitution of the molds being greatly facilitated, meanwhile, by the movable platforms. [John R. Gammeter, Akron, Ohio, assignor of The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,232,022.]

A SELF-CONTAINED TIRE VULCANIZING MOLD.

This novel mold is adapted to be used for building up the carcass of pneumatic tires and vulcanizing them without removal from the mold until the time has elapsed to effect the cure.



In the illustration, which shows a vertical section and an approximate section taken on the line *A*, *B*, *C* is the mold that is bolted to any convenient support and provided with heating chambers, *D* is the sectional core and *E* the core expanding device comprising four adjusting screws.

In practical operation the various plies of frictioned fabric constituting the carcass are successively placed within the mold and shaped by hand and the heads applied. When this operation is finished the three straight sections of the core are mounted in place and finally the top or wedge-shaped section is introduced. The four screws of the expander being retracted, it is then located within the core, the heads of the screws alining with the channel grooves, and when the screws are expanded the core forces the casing against the walls of the mold. Any suitable means may be employed in curing, but in this instance electric heaters are introduced into chambers provided in the base of the mold for that purpose. [Fred Brown Pfeiffer, Akron, Ohio. United States patent No. 71,231,645.]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

1,230,262. Machine for wrapping rubber tubes. I. Zwisler, assignor to The McGraw Tire & Rubber Co.—both of East Palestine, Ohio.

1,230,415. Tire building machine. F. W. Kremer, Carlstadt, New Jersey.

1,230,789. Repair vulcanizer. J. B. Rose, assignor to The Marvel Accessories Manufacturing Co.—both of Cleveland, Ohio.

1,230,947. Tire builder's tool. W. Thompson, assignor to Morgan & Wright—both of Detroit, Michigan.

1,232,764. Apparatus for manufacture of hollow rubber articles. J. W. Brundage, assignor to The Miller Rubber Co.—both of Akron, Ohio.

1,232,782. Machine for testing plastics. W. E. Field, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.

1,232,787. Fluid press for rubber footwear. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City, a corporation of New York.

1,233,013. Device for decorticating fibrous leaves of plants. J. E. Askew, assignor of one-half to T. M. Fairbairn—both of San Antonio, Texas.

1,233,059. Cloth spreader or expander. A. Isherwood, Boston, Mass., assignor to T. Kenyon, Manchester, England.

1,233,079. Flexible core for tire strip forming machines. J. T. Lister, Cleveland, Ohio.

1,233,257. Automatic web guiding device. W. L. Lewis, Walpole, Mass.

1,233,260. Core jack. J. H. Mulloy, Detroit, Mich., assignor to Morgan & Wright, a corporation of Michigan.

THE UNITED KINGDOM.

105,426. Solid tire tubing machine. F. W. East, 1 Llanberis Villas, Tennyson Road, and A. G. East, Hugo Villa, Carlton Road—both in Harpenden, Hertfordshire.

THE DOMINION OF CANADA.

175,567. Machine for making rubber footwear. The Boston Rubber Shoe Co., Boston, assignee J. W. Moore, Newton Highlands—both in Massachusetts, U. S. A.

175,568. Indicator for rubber mill rolls. Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of G. E. Nettleton, Hartford, Connecticut, U. S. A.

175,636. Mold for rubber shoes. G. C. Clark, Mishawaka, Indiana, U. S. A.

175,920. Repair vulcanizer. E. Bellerose, Cohoes, New York, U. S. A.

176,005. Vulcanizing apparatus. Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of C. J. Randall, Naugatuck, Connecticut, U. S. A.

THE FRENCH REPUBLIC.

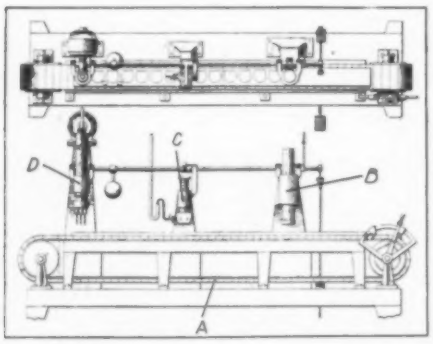
482,780 (September 5, 1916). Method and apparatus for manufacture of articles of hollow rubber. Else Aranas Co.

482,850 (September 13, 1916). Improvements in vulcanization apparatus. The Goodyear's Metallic Rubber Shoe Co.

PROCESS PATENTS.

PROCESS OF MAKING HEELS OR SOLES FROM SOLID TIRE SCRAP.

THE utilization of rubber scrap, such as solid tires, in the manufacture of rubber heels or soles and without further reclaiming, is the object of the present invention. The tires are first cut into convenient lengths and clamped in a holder with the base portion exposed. This rough surface is ground off by an abrasive wheel, when the tire section is removed and placed in another holding device operating in connection with a band saw that divides the tire longitudinally into slabs of suitable thickness. These flat strips are then delivered to the machine shown in side elevation and plan in the accompanying illustration. An endless conveyor belt *A*, moved intermittently by the ratchet wheel and hand lever shown on the right, carries the stock under a treadle-operated die press *B* that punches out the heel blank, but leaves it within the slab. As the slab advances each heel blank is branded with a heated die as it passes under the device shown at *C*, and the nail holes are finally drilled by the multiple drill *D*, when the finished heels are carried from the machine by the conveyor belt. The periodic movement of this conveyor belt is obtained by a hand lever; the punching, branding and drilling operations are performed in unison by a foot treadle, while the drills are driven by a small electric motor. [Frederick D. Philip, Royal Oak, assignor of one-half to Allen A. Templeton, Detroit—both in Michigan. United States patent No. 1,230,510.]



POROUS RUBBER FABRIC. Open mesh fabric is coated and partially impregnated with rubber solution, after which the coating is perforated at the interstices by fluid pressure, the solvent evaporated and the rubber vulcanized. [Arthur B. Kempel, Akron, Ohio, assignor to The B. F. Goodrich Co., a corporation of New York. United States patent No. 1,229,284.]

OTHER PROCESS PATENTS.

THE UNITED STATES.

1,230,867. Hose and the process of making the same. H. Z. Cobb, Winchester, Mass., assignor to Revere Rubber Co., Olneyville, Rhode Island.

1,232,110. Process for the manufacture of tapered air-chamber sections. T. Sloper, Devizes, England.

1,232,374. Process of manufacturing yarn from fibers which are too slippery to be successfully spun in their normal condition consisting in treating the fibers with a mobile solution of rubber. W. E. Muntz, London, England.

1,232,573. Process of treating soles of rubber. C. Lee, Naugatuck, Conn., assignor to The Goodyear's Metallic Rubber Shoe Co., a corporation of Connecticut.

THE DOMINION OF CANADA.

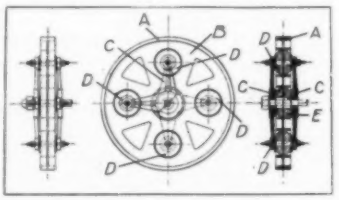
175,798. Rubber preparation. H. Hunter, Indianapolis, Indiana, U. S. A.

176,009. Plastic vulcanizing process. Canadian Consolidated Rubber Co., Limited, Montreal, Quebec, assignee of C. J. Randall, Naugatuck, Connecticut, U. S. A.

MISCELLANEOUS PATENTS.

FRENCH RUBBER CUSHIONED WHEEL.

THIS is a wheel of the disk type that is evidently designed for military motor trucks, wagons and gun carriages. Referring to the illustrations, the wheel comprises a metal tire *A* that may be rubber shod, two side plates or disks *B* and two star-shaped pieces *C* that hold the four rubber cushions *D* and the rubber hub *E* in place. Metal rings encircle the four outer rubber cushions that are held in place by the two star-shaped pieces and four compression bolts. The rubber hub cushion is also provided with an outer metal band and is supported on the axle of the wheel by a metallic sleeve through which the axle bolt passes. [G. Constani. French patent No. 482,308.]



The affairs of the defunct Northland Rubber Co. were closed in the Supreme Court on July 17, when Justice Sears confirmed the receiver's report by which the creditors of the company will realize about 70 cents on the dollar, while the stockholders will suffer a total loss according to statements made to the court. The plant was recently sold to the Kelly-Springfield Tire Co. for $270,000.

The Scioto Rubber Co., of Columbus, Ohio, has filed a damage claim against that city for $24,500 based on the grade elevation of the railroad tracks at East Fifth avenue which has practically shut off means of access to the company's plant.

The Porter Rubber Co., Salem, Ohio, recently voted to sell $110,000 of its treasury stocks. Funds realized will be devoted to an increase of capacity, the present output being 100 tires daily.

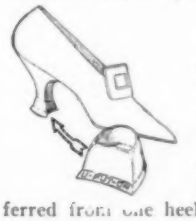
New Goods and Specialties.

"LIBERTY" BATHING CAP.

THE rampant tricolors are attractively in evidence on one of the new bathing caps, shown herewith. The full-shaped red rubber body of the cap is gathered into a close-fitting band of blue, frilled at the top with white and decorated with white stars at intervals of about two inches, and a red rosette in the center of the front. [The Seamless Rubber Co., Inc., New Haven, Connecticut.]

THE "U-PUT-ON" RUBBER HEEL.

The rubber heel has until lately been made almost exclusively for low-heeled shoes, and was more suited to men's, boys' and children's footwear, or for the athletic type of women's shoes. The small French or Louis heels worn by fashionable women presented a problem to the rubber-heel maker, but this is happily solved by the "U-Put-On" heel, which, as its name indicates, can be attached by the wearer, it being a sort of socket or tip which slips over, and clings tightly to the heel of the shoe. It can be readily transferred from one heel to another and adjusted to wear evenly. An arrangement of vacuum cups in the central portion prevents slipping. These heels are supplied in four sizes, suited to the various types of French heels, and in black, gray, tan or white colors. [Robert E. Miller, Inc., 11 Broadway, New York City.]



RUBBER PROTECTOR FOR NURSING BOTTLE.

Nursing bottles are very subject to breakage, either by unavoidable accident or as the result of the infant's throwing the bottle from the carriage or crib. An ingenious device recently placed on the market is a cage-like frame of soft white rubber, designed to protect the bottle from injury. This rubber frame can be boiled and sterilized without being removed from the bottle and is therefore convenient and perfectly sanitary. [J. E. Cosgriff, 347 Fifth avenue, New York City.]

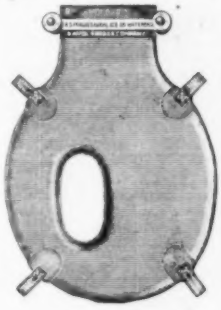
AN OFFICIALLY TESTED TIRE FILLER.

There are many fillers on the market, designed to seal punctures in tires. It is a comparatively simple matter to make a material, which, placed inside the tube, will stop punctures more or less effectively, and for a longer or shorter time. But to discover or invent a material which will not cause any deterioration to the tube is a somewhat greater problem.

That this has been accomplished is the claim for Crew Levick Tire Seal, a semi-liquid material which has been severely tested officially by the laboratory engineer of the Automobile Club of America, a report of a certified test showing that the material did all that was claimed for it under tests which included driving nails and leaving them in, driving other nails and immediately pulling them out, cutting with a penknife and allowing to heal, cutting larger slits and patching and vulcanizing. Even under such treatment pressure tests showed almost no loss of pressure in three days' runs, totalling almost 300 miles. It is claimed by the makers that this material is not harmful to tubes, but rather is really a preservative, and that tubes containing this filler will last longer than those without it. [Crew Levick Co., Philadelphia, Pennsylvania.]

IMPROVED AURAL ICE BAG.

The aural ice bag of improved design shown here is pronounced very efficacious in cases of mastoiditis. By means of an opening through the bag which allows it to fit under and around the ear, application is made directly at the point desired to be reached. Pure gum, in the natural gray color, is used in the manufacture of this aural ice bag, and a new patented clamp, of the snap-lock variety, is supplied with it. The mouth of the bag is closed by inserting between the folds of a metal plate and held in place by a metal frame, a simple pulling motion clamping it firmly together. [Davol Rubber Co., Providence, Rhode Island.]

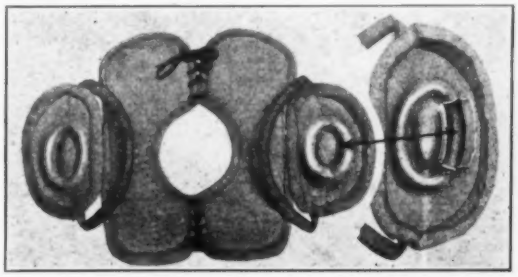


GAME WITH RUBBER BALL.

In the game called "Shinny in the Box," here illustrated, a solid rubber ball 2½ inches in diameter is used. This game is adapted to players of all ages and is said to afford opportunity for the exercise of skill and endurance, as well as being highly amusing to the onlookers. It can be played by two persons or by teams of two or more on a side. The opposite side of the box is marked out so that rubber quoits may be played, and the complete set consists of box, sticks, rubber balls, quoits and stand. [Wright & Ditson, 344 Washington street, Boston, Massachusetts.]

SHOULDER PAD WITH RUBBER TUBING.

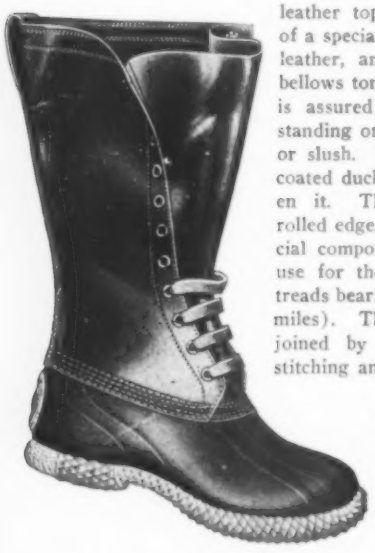
Playing football may not be as perilous as assaulting enemy trenches, yet there are many chances for serious injury. The football player of to-day has a costume conspicuous for shielding him from such injuries and a new shoulder pad is shown here which has for its effectiveness an air-filled ring of rubber



tubing held in place over the point of the shoulder bone by a lining of leather secured all around both sides of the tubing and padded in the middle. Another rubber tube goes under the arms, and this and the laced collar hold the pad in position. It is claimed that even the severest blows on the shoulders, thus protected, are hardly noticeable. The same idea, a round rubber pneumatic ring, is used in a knee pad with equally good results. [Sell Sporting Goods Co., Canton, Ohio.]

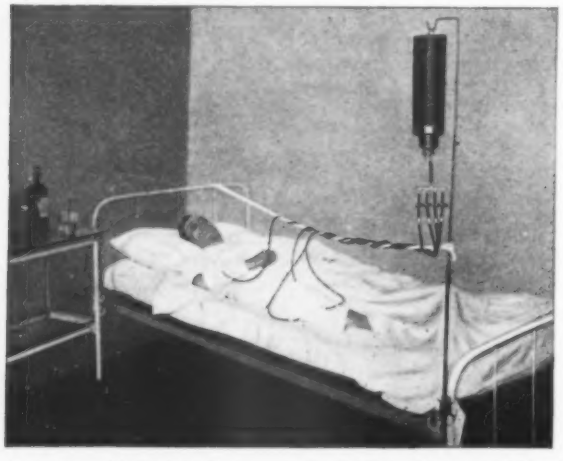
A WHITE-SOLED PAC.

A boot calculated to stand the hardest wear, and give comfort and long service to the outdoor worker is here illustrated. It is a combination of rubber foot and leather top. The latter is made of a specially prepared waterproof leather, and is provided with a bellows tongue, so that the wearer is assured dry feet, even when standing or walking in deep snow or slush. The upper is of heavy coated duck with ribs to strengthen it. The white sole has a rolled edge, and is made of a special compound which the makers use for their tire treads; (these treads bearing a guarantee of 5,000 miles). The top and upper are joined by four rows of heavy stitching and a loop is formed by a continuation of the backstay. This is an excellent boot for heavy outdoor work in winter. [Converse Rubber Shoe Co., Malden Mass.]



MULFORD APPARATUS FOR APPLYING CARREL-DAKIN SOLUTION.

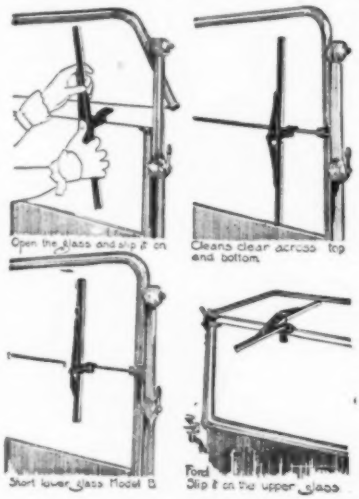
An apparatus for applying the Carrel-Dakin solution, widely known through its use in the war for irrigating wounds, has lately been perfected by the firm of manufacturing and biological chemists which also makes the solution itself.



A series of individual connecting tubes makes possible the treatment of several wounds at one time from the same reservoir, the special thick-walled rubber tubing with very fine bore permitting only a minimum loss in temperature of the solution as it passes through these connecting tubes. Absolute control of the amount of solution flowing to each individual instillation tube is maintained by observing through the individual sight drips and regulating by means of metal clamps. The collapsible stand furnished with the outfit has adjustable collars attachable to any size bed post. This apparatus can also be adapted for the "Murphy drip" and for hypodermoclysis. [H. K. Mulford Co., Philadelphia, Pennsylvania.]

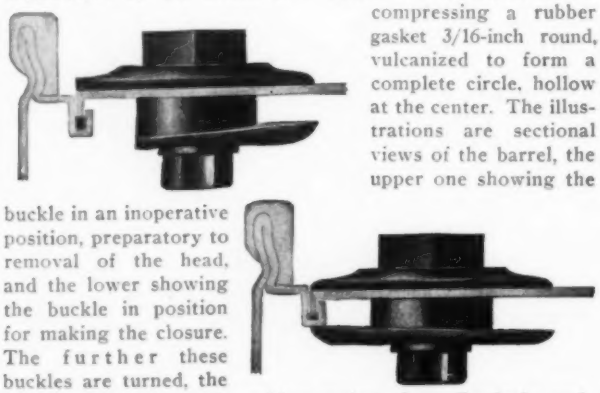
THE TRI-CO UNIVERSAL RAIN RUBBER.

Many of the devices for cleaning the windshield of a motor car in a storm are stationary, forming an unsightly attachment in clear weather when their use is not demanded. This simple little device is designed to be quickly and easily attached and detached from a two-piece shield. It consists primarily of a traveling section which is mounted in and slides along the opening between the upper and lower halves of the windshield, holding on to the edge of the glass by a channel. Two arms project from this section, one to each panel of the shield, and on each arm are two rubber strips set edgewise, so that when moved across the glass surface, water is pressed off by the close fit of rubber to the glass. To prevent possible scratching of the glass, the rivets holding the various parts together are topped with celluloid where there is any chance of contact. This windshield cleaner is made in five models, to fit practically any type of two-piece windshield. [Tri-Continental Corporation, Sidway Building, Buffalo, New York.]



METAL BARREL WITH RUBBER GASKET.

A new type of metal barrel has a 6-inch opening and, also, a special removable head which can be made absolutely liquid-tight by the action of a series of buckles, or bolts, compressing a rubber gasket 3/16-inch round, vulcanized to form a complete circle, hollow at the center. The illustrations are sectional views of the barrel, the upper one showing the buckle in an inoperative position, preparatory to removal of the head, and the lower showing the buckle in position for making the closure. The further these buckles are turned, the tighter they squeeze the rubber gasket, thus effectively sealing the barrel. The removable head allows this barrel to be used economically for the shipment of powders such as red or white lead, or heavy oils, paints, varnishes and greasy substances difficult to clean out of the ordinary barrel. [Detroit Range Boiler Co., 607-623 Twenty-fourth street, Detroit, Michigan.]



The Editor's Book Table.

THE COTTON YEAR BOOK AND DIARY, 1917. BY S. ECROYD. Marsden & Co., Limited, Manchester, England. [868 pages, 4 by 6 inches, leather-bound. Price, 2*s.* 6*d.*, net.]

THIS annual, of which the present volume is the twelfth issue, contains in compact compass a vast amount of information regarding the cotton industry in England. A review of the cotton trade for 1916, the exports and imports, the yields of cotton crops all over the world, the profits and losses of English cotton mills, patents, and much statistical information, properly tabulated. A large part of the book is given over to information regarding processes and machinery, every detail of manufacture being explained, with simple illustrations and diagrams. A diary is added, with suggestions as to the week's work in maintaining mill and office efficiency. The book is one which will be found valuable for reference by all manufacturers of cotton fabrics.

THE EFFECT OF WARS AND REVOLUTIONS ON GOVERNMENT Securities, External and Internal. By E. Kerr, Librarian, William Morris Imbrie & Co., Bankers, New York City. [8vo, boards, 131 pages.]

This handsome book for distribution to investors recalls the principal historical events of ten leading modern nations during the last century and presents much information about government indebtedness, wealth, bond issues and their prices in tabular form covering periods of 50 to 100 years. These compilations are unique and add much to the interest and value of the book as a work of reference.

It is pointed out that although wars and revolutions may retard civilization temporarily, they have the immediate effect of stimulating human thought and endeavor, resulting in a period of expansion and invention in the defeated as well as the victorious country.

HOW TO BUILD UP FURNACE EFFICIENCY. A HANDBOOK OF Fuel Economy. By Jos. W. Hays, Chicago, Illinois (16 mo., paper, 154 pages. Price $1, postpaid.)

With fuel costs abnormally high, this book of practical information by a combustion engineer should find favor with every firm having a steam power plant. Written in a breezy vein, the work will prove entertaining as well as informative, and indicates that all scientific treatises need not be as dry as dust from a literary standpoint. In the words of the author, the book consists of five reels, including a few snorts about industrial efficiency and other things, together with an appendix devoted to oils, gas, wood refuse and other fuels. The five reels tell pointedly and in graphic fashion why and how fuel is wasted, how to spot and stop these wastes, and how to keep them stopped.

STATISTICS OF MANUFACTURES, COMMONWEALTH OF MASSAchusetts. Thirtieth Annual Report. Bureau of Statistics, Boston, Massachusetts. [Paper, 8vo, 130 pages.]

With boots and shoes the principal industry of the state, it is not surprising that footwear should lead the rubber industry; and according to this latest source of official information rubber footwear was manufactured to the value of $27,414,901 by an average of 9,274 wage earners in 8 establishments, representing an invested capital of $23,184,118. Woven belting and hose to the value of $1,060,686 were produced by an average of 195 operatives in 6 establishments, representing an invested capital of $1,172,515. Miscellaneous rubber goods amounted to $25,805,175, and were the product of an average of 5,078 wage earners in 36 factories, representing an invested capital of $20,106,498. Each classification showed a big increase over the preceding year, the largest, that of footwear, being $3,626,113.

THE LAW OF PATENTS FOR DESIGNS. BY WILLIAM L. Symons, LL.M. John Byrne & Co., Washington, D. C. [8vo, 134 pages, buckram binding. Price, $3.]

This important work treats in a simple and concise manner the practice which obtains in the prosecution of applications for design patents in the United States Patent Office as shown by the rules and decisions. Its six chapters are devoted to Design Patent Statutes; Subject Matter for Design Patent; Invention; Novelty and Infringement; Applications and Letters Patent; Procedure in the Patent Office. Design patents are of great interest to lawyers, manufacturers and others dealing with industrial development, and this is the only text book on the subject published since 1889. The history of the design patent law; its development, and the present law are fully discussed. The author is a member of the bar of the District of Columbia, a lecturer at the Washington College of Law, and an examiner at the United States Patent Office. It is not surprising, therefore, that his book has been cited as an authority in briefs filed in the Supreme Court of the United States as well as in many federal courts, and that it has been quoted in decisions rendered by the Patent Office. Since its publication in 1914, two supplements have been issued reviewing all decisions and Patent Office rules published on this subject up to October 1, 1916.

PENANG CHAMBER OF COMMERCE. REPORT FOR THE YEAR 1916. [Cardboard cover, 122 pages, tables.]

In spite of shipping difficulties, those countries in a position to supply material needed in the great European conflict are prospering in no inconsiderable measure and Penang, a tin and rubber exporting center, is no exception. The volume of trade during the year 1916 shows a marked increase over that for 1915; money is plentiful, bankruptcies few and generally unimportant. The new Bangkok-Penang-Kuala Lumpur line by which railroad communication is established between Siam and the Malay Peninsula—also plans for developing the part of Prai—are further indications of a growth which owes not a little to the impetus of the war. The question of alienation of land to foreigners naturally finds a place in the report, and it is gratifying to note that although the vast majority of producers in Malaya are badly infected by the American scare, there are a few—but a very few, let it be said—who have remained immune and are able to look at the matter with impartiality.

STATISTICAL ABSTRACT OF THE UNITED STATES, 1916. Thirty-ninth Number. Department of Commerce. Government Printing Office, Washington, D. C. [Paper, 8vo, 773 pages. Price, 50 cents.]

This annual publication of the Bureau of Foreign and Domestic Commerce contains the official statistics of the United States relating to area, natural resources, population, etc.; education, agriculture, forestry and fisheries; manufactures and mines; occupations, labor and wages; internal communication and transportation; merchant marine and shipping; foreign commerce; commerce of non-contiguous territory; consumption estimates; prices; money, banking and insurance; public finance and national wealth; army, navy, civil service, pensions, etc.; statistical record of the progress of the United States; commercial, financial and monetary statistics of the principal countries of the world.

According to the summary of manufactures for the census year 1914, 49 establishments manufacturing woven and rubber hose, representing a capital of $27,285,000 and employing 7,394 persons, turned out a product valued at $28,002,000. Rubber boots and shoes to the value of $53,822,000 were manufactured by 23 establishments, representing a capital of $46,051,000 and employing 20,359 persons. Miscellaneous rubber goods amounting to $223,611,000 were the product of 301 establishments, representing a capital of $199,183,000 and employing 62,257 persons.

A table of crude rubber imports from the time of the Civil War up to the present shows an almost constant gain from 2,125,561 pounds in 1862 to 267,775,557 in 1916, an increase of over 127 times. The table of average import prices of india rubber and gutta percha* crude per pound from 1892 to 1916 is also of interest. It gives the price in 1892 as 49.3 cents, and in 1916 as 57.9 cents, but shows the price of 42.9 cents in 1893 to be the lowest and of 105.8 cents in 1911 to be the highest during the period.

Exports of domestic manufactures of india rubber of all sorts have increased from $6,543,735 in 1906 to $35,153,374 in 1916. Exports of foreign unmanufactured india rubber, gutta percha and substitutes, however, have fallen off from $5,063,065 in 1912 to $2,929,405 in 1916, although exports of foreign manufactures of india rubber and gutta percha have increased from $6,746 in 1912 to $39,186 in 1916.

DE GOUVERNEMENTS - RUBBERONDERNEMING "SLOOTWIJK." Rapport van den Directeur van het Caoutchoucbedrijf bij het Boschwezen in Nederlandsch-Indie, met verlof in Nederland, H. J. van Hasselt, ingevolge opdracht van Zyne Excellentie den Minister van Kolonien by besluit van 25 October 1915, Afd. A3 en B., No. 34. [Paper cover, 104 pages.]

"The government is the body least fit to cultivate a doubtful crop." With this drastic quotation the author commences the history, present condition and future prospects of the government's rubber plantation, "Slootwijk," in Surinam, and the statement is fully borne out by the story of failure that follows —failure due to ignorance of the most essential points in rubber cultivation, to grave mistakes in management and administration. A comparison of the estate as it is after past errors have been retrieved as far as possible, with government estates in the East, as well as investigation into the condition of other crops in Surinam, lead the author to conclude that *Hevea* planting in the latter country does not pay and should absolutely not be encouraged.

NEW TRADE PUBLICATIONS.

MUCH favorable comment has been elicited by the striking advertising design entitled "Fisk Tires at the Beginning," which appeared on billboards throughout the country during the month of June. The work of N. C. Wyeth, an American artist of international fame, this poster depicted stalwart negroes coming out of South American forests laden with huge baskets of crude rubber.

* * *

"Bowohoco News" is the name of a very readable four-page paper published monthly in the interests of the employes of the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts. In addition to the personals of this thriving factory, inspiring statements regarding the progress of the business are made and much valuable information to all engaged in rubber manufacture is reported. The staff consists of William F. Wall, editor; John B. Kelley and Grant L. Wiswell, associate editors.

* * *

The Link-Belt Co., Chicago, Illinois, is sending out a strikingly effective booklet entitled "The Ideal Drive for Textile Machinery." The silent chain drive made by this concern is fully explained, and a large number of half-tones illustrate the use of these drives in textile mills. The cover and the borders of the pages so thoroughly imitate woolen goods as to surprise those who receive the booklet.

* * *

Advice is made up principally of don'ts and do's, and the don'ts predominate. The Goodyear Tire & Rubber Co., Akron, Ohio, has issued a set of bulletins for tire users. Each is a little leaflet, about envelope size, devoted to one particular phase of tire service. The list comprises "How to Increase Tire Mileage," "Proper Inflation Pays," "What to do for Tread Cuts," "Fabric Breaks," "How to Avoid Scraped Treads," "Premature Tread Wear," "How to Use Chains," "How to Make Inner Tubes Last Longer," "Rim Cutting," "Chafed Side-Walls" and "The Way to Maximum Mileage."

* * *

The Batavia Rubber Co., Batavia, New York, has issued a neat little advertising souvenir representing a wire wheel, to which is fitted a miniature tire of real rubber, bearing the ribbed tread used by this company. The whole affair is only a little more than two inches in diameter, and while it may not have been intended to be used as an eraser, it has proven efficacious in this particular.

FAULTLESS "WEAREVER" ADVERTISING ON BROADWAY.

The Faultless Rubber Co., Ashland, Ohio, manufacturer of "Wearever" rubber goods, has been chosen as representative in the household rubber goods field of the high ideals for which the Rice Leaders of the World Association stands.

As an association member the Faultless company will flash its messages to the public every night on the mammoth electric sign erected on the roof of the Hermitage Hotel, New York City. This elaborate sign occupies one thousand square feet of space, and the display, illuminated with thousands of brilliantly colored electric lamps, makes a most beautiful picture which attracts the attention of over 70,000 persons who pass through this great thoroughfare nightly—not only New Yorkers, but thousands of visitors to the great metropolis.

THOSE WISHING TO KEEP INTIMATELY POSTED ON ALL SUBJECTS pertaining to American preparedness and participation in the war will find the pages of "National Defense and the International Digest" intensely interesting. This attractive monthly magazine is published by the Writers' Press Association, 304 Madison avenue, New York City, at $1 a year; foreign subscription, $1.50. It contains many well-illustrated articles by prominent army and navy officers, eminent engineers and manufacturers, and leading publicists on timely topics of national and international importance.

A VIVID WORD PICTURE OF AKRON, OHIO, "THE RUBBER CITY," as it was, is and will probably become, detailing the phenomenal expansion of its titanic industries, depicting its present social and living conditions, and outlining the gigantic civic problem confronting its leading men, is entitled "Akron: Standing Room Only!" by Edward Mott Woolley, the leading article in "McClure's Magazine" for July. Seldom has fiction proved more fascinating than the authenticated facts there presented.

*India rubber only after 1890.

Interesting Letters from Our Readers.

MANUFACTURERS SOUGHT FOR WEBBED GLOVE.

To the Editor of the India Rubber World:

DEAR SIR—Enclosed you will find photograph of the very first webbed glove that I made. The webs are solid piece with the rest of the glove. I made it on a plaster paris mold of my own design.

I would like to find someone to take up manufacturing on a large scale, as I already have large orders from the biggest dry goods houses in the country to bring them in to put on sale. Or I would make liberal arrangements to manufacturers on a royalty basis for the whole United States. My patent is one of the best and my mold is registered also. I have the whole market of the world before me.

A. K. Zawodzski.

2405 E. Allegheny avenue, Philadelphia, Pennsylvania, July 22, 1917.

RUBBER CARGOES AND THE SUBMARINE.

To the Editor of The India Rubber World:

DEAR SIR—Brazilian rubber and other cargoes destined to the United States now enjoy the protection of an American squadron which arrived in Rio de Janeiro early in June to relieve the British and French patrol of the western hemisphere and was accorded a hearty welcome by the Brazilian Government, the Chamber of Deputies cabling a message of congratulations to the Congress of the United States. This act, together with the seizure of 46 interned German ships following revocation of neutrality by Brazil, seems to foreshadow her active cooperation with the United States in the war.

Already the American navy is making itself felt in the submarine zone where U-boat work is materially weakening. The arrival of our destroyer flotilla and of allied cruisers released from American waters has provided more ships, while progress in the prosecution of the anti-submarine campaign and more vigorous offensive measures have greatly reduced the list of sinkings for several weeks past. Naval experts believe the improvement is cumulative, and that another "black week" will not occur. Gun crews of merchant ships are also doing good service in beating off attacks, and have bagged one or more U-boats, while the steamship "Mongolia," which fired the first gun and made the first hit for America in the war, has again come into the limelight, having exchanged four shots with a German submarine that fired a torpedo at her on her last passage to London. Neither the liner nor the submarine was hit.

Shortage of ships and consequent high cargo rates have materially increased the cost of production of rubber goods, but have by no means become the serious matter that they might. With the government shipbuilding program well under way, no serious interruption of the crude rubber supply seems likely, but should unrestricted submarine warfare really threaten the American rubber industry leading men in the business may well jointly turn to Simon Lake for relief. It was he who invented the submarine and he, if anybody, who can defeat it. The world no longer laughs at Simon Lake, for he has made good all his statements and all his prophecies have come true. His statement that the German submarine can be beaten at its own game of invisibility by submersible cargo boats appeals to every thinking man as a last resort that cannot fail, but Lake goes a step farther and points out certain advantages held by this type of ship in peace times, thus indicating that the construction of such vessels may properly be regarded as better than an emergency investment. The "Deutschland" proved that subsea commerce is absolutely practicable, but whereas she carried only about 500 tons of merchandise, the huge undersea cargo boats Lake stands ready to build according to his latest standardized plans are of 5,000, 7,500 and 10,000 tons dead weight carrying capacity, designed not for speed but for safety in operation and utilizing almost any kind of propelling power most readily obtainable. Germany is reported to have been planning a fleet of such submersible merchantmen when the United States entered the war and our ports were closed to German ships. Now the opportunity is ours or that of our allies. Narrowing the matter down to crude rubber imports, England could perhaps profit more by such ships than America, because at present most of our rubber reaches us direct from the Far East and absolutely unmolested. On the other hand, Germany figures that she can accomplish most by confining her attacks to the congested sea lanes of the English channel where the maximum of ships may be sunk with the minimum of effort and time. As a happy sequel to the death and destruction wrought by the war submarine it would be a satisfaction indeed to have this wonderful invention rehabilitated for constructive service in peaceful merchant shipping.

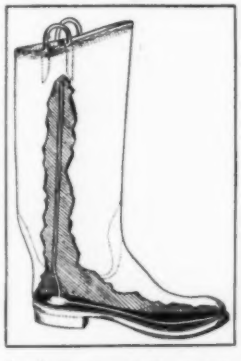
Onlooker.

Boston, June 28, 1917.

AIR SUPPLY DEVICE FOR RUBBER BOOTS.

To the Editor of The India Rubber World:

DEAR SIR—I cannot see why rubber companies do not manufacture something in the way of a pneumatic insole to keep the feet dry when wearing rubber boots. I made a pair over 30 years ago and still have this first crude affair. The insole was provided with a flat rubber bulb at the heel. From the back of this bulb a tube passed up beside the ankle to the top of the boot. From the front of the bulb there was a flexible tube within the insole to a point near the toe. The operation of the sole was this: As the weight was thrown on the heel (in the advance step), the heel acted as an automatic valve and closed the back tube, at the same time forcing fresh air out of the front tubing at the toe. As the perpendicular line of bearing was carried forward, and the weight came upon the ball of the foot, the front tubing was closed. The pressure on the bulb then being released, it at once took a fresh supply of



air from the top of the boot, and so on alternately at every step, thereby keeping the feet sweet, clean and dry.

All who have worn rubber boots, especially in warm weather, know the torture they undergo and I would like to see such a thing put on the market at a reasonable price.

M. C. BARDEN.

West Pawlet, Vermont, June 4, 1917.

As far back as 1890 the Hannaford ventilated boot, manufactured in Boston, was on the market. It had an elastic middle sole with compressible air cells connected with a tube extending to the top of the leg. It was similar in action to Mr. Barden's device, though the pneumatic feature was an integral part of the boot. We understand Mr. Barden's idea is a separate insole which can be placed in any of the boots now manufactured. Some years ago the Commonwealth Shoe & Leather Co., of Boston, Massachusetts, bought out the "Resilia" shoe, which had a ribbed rubber inner-sole effecting the same purpose, the air intake being at the breast of the heel. Its manufacture was discontinued after it had been on the market a few years. Undoubtedly any effective method of ventilating rubber boots must conduce to the comfort of the wearer.—THE EDITOR.

PFYFFER'S RESILIENT WHEEL WITH PNEUMATIC HUB.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR—Your good description of my resilient wheel in the June issue, page 523, leads me to supplement additional information regarding its operation, which is based upon a new and thus far not generally admitted principle.

As it was your book "Rubber Tires and All About Them," which, more than anything else, showed me the right trail, especially by way of what you said on page 30 about the way in which a pool of water "receives a solid body thrown into it," I should like first of all to thank you for this book and then to take the liberty of submitting the main principle upon which my invention is based, to your kind personal investigation.

The whole question is whether or not from a given pneumatic tire, with a given inflation pressure and a given load, or load-shock, there is a bigger depression obtainable when the tire is in contact with a convex-shaped rigid member encircling the tire, than when the tire is in direct contact with the flat road.

My convex-shaped member *D* takes, so to say, the place of the pebble on the road in relation to the pneumatic tire, or the place of the "solid body" of your book (page 30) thrown in a pool of water. Not being able to increase the pool of water, I practically reduced the size of the solid body by reducing the size of the bearing part of the member *D*.

All the many attempts made long ago to obtain a really puncture-proof pneumatically cushioned wheel by putting an inflated tire somewhere between rim and axle instead of between rim and road proved to be a failure because no satisfactory resilience was obtained. The fact was always overlooked that the position of the tire inside of the rim necessarily means an enormous increase of the bearing surface, the encircling rigid member always bearing upon one-half of the circumference of the tire (in length). Now by means of the convex shape of the encircling rim I reduce at will the width of the bearing surface, thereby counterbalancing the increase in length. The result, as proved by my working model, is a lively cushioning effect not hitherto obtained from a pneumatic tire placed inside of the rim.

Repeated tests with my working model have confirmed the following facts:

1. A considerably deeper depression is obtained in contact with the convex-shaped member than the depression obtainable in direct contact with the flat road.

2. All other factors being the same, the depression is increased in proportion to the reduction of the radius of the rigid member's convexity.

3. A stronger inflation is allowed when the tire is bearing upon the convex-shaped rim without the increased inflation pressure, giving such hard riding as would result from the same inflation in direct contact with the flat road.

4. Given a certain depression of the axle, a much gentler bend of the tire is obtained in contact with the convex-shaped encircling rim than the bend obtained in contact with a flat body, and this is the case in the plane parallel to the wheel as well as in the plane rectangular to the wheel.

5. The road shocks operate in my resilient wheel in an entirely different way according to their nature; those which are strong and persistent enough to overcome the *inertia* of the whole rim-section of the wheel being transmitted to and absorbed by the internal pneumatic tire, while quicker or weaker shocks are absorbed by the rim parts (solid rubber or other material) in contact with the road, eventually spoiling them to a certain extent. Thus practically all shocks are prevented in one way or the other from reaching the axle.

These five facts are of far-reaching importance, opening up an entirely new field for the use of pneumatic tires in well protected and well supported position somewhere between rim and axle, be it in addition to the usual pneumatic tire in contact with the road, when softest resiliency is wanted (*twice* pneumatically cushioned ambulance cars) or in combination with solid tires or even bare steel rims in contact with the road for commercial and war vehicles, where unfailing reliance and low maintenance cost under rough conditions is required. Power losses such as Professor E. M. Lockwood referred to in THE INDIA RUBBER WORLD of May, 1917, page 447, as being due to "flexure at the contact with the road" and to "under-inflation," are reduced to the minimum.

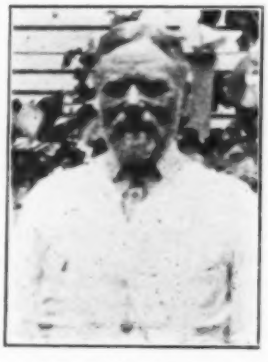
DR. P. DE PFYFFER.

New York City, June 5, 1917.

THE OBITUARY RECORD.

AN OLD-TIME RUBBER MAN.

HUGH A. NEWELL, for many years connected with prominent rubber companies in the capacity of superintendent, died at his home in Reading, Massachusetts, on July 10, aged 72 years.



HUGH A. NEWELL.

He was born in Belfast, Ireland, and came to America when about 22 years old. His first position was with the Revere Rubber Co., Chelsea, Massachusetts, in its coated fabric department, where he worked for three years, going from there to the Aetna Rubber Mills, which were owned by Clapp, Evans & Co., at Jamaica Plain, Massachusetts, where rubber boots, clothing and general molded goods were made. Here he advanced to foreman under the superintendence of Wheeler Cable. After 12 years with the Aetna company, in 1881, the Cable Rubber Co. was formed for the manufacture of high-grade rubber clothing and carriage cloth, and Mr. Newell became its superintendent. After nine years with this concern he went to the Reading Rubber Manufacturing Co., Reading, Massachusetts, filling the position of superintendent of that company for 22½ years. His next position was with the International Rubber Co., West Barrington, Rhode Island, then a small concern with a single calender, and which during his five years' connection grew to treble its former capacity. He retired from active business a few years ago and returned to Reading, where he had spent so many of his active years. At his death he was a member of the Baptist Church of that town.

Mr. Newell was well known in the trade as an able and efficient

official for the different concerns with which he was connected. He is survived by two sons, James, now with the Reading Rubber Manufacturing Co., and Harry K., who was formerly with the International Rubber Co., and two daughters, his wife having died seven years ago.

A RAINCOAT MANUFACTURER.

William O. Anderson, president of the L. M. Anderson Co., manufacturer of rainproof garments, Trenton, New Jersey, was drowned in the Delaware and Raritan Canal, which is near the factory of the company, July 7. It is thought that his mind became temporarily unbalanced, as he brooded over the automobile accident of a day or two previous, for which he might have considered himself responsible, and in which three persons were severely injured. The deceased was at the head of the above named company, and was active in its management. He was 60 years of age at the time of his death. He leaves a widow, and one son, A. J. Anderson, who is vice-president of the same manufacturing company.

A POPULAR SALESMAN AND EFFICIENT MANAGER.

John P. Stockton, president of The Globe-Gibraltar Rubber Co., Cleveland, Ohio, died July 19 at St. Luke's Hospital in that city, as the result of an automobile accident six days previous. Mr. Stockton was about 36 years of age, and was a very successful tire salesman. He had a large acquaintance in the trade and gained many friends wherever he traveled. It was through his genial disposition that he made a success of the Armstrong Rubber Co., which is now the Globe-Gibraltar company. He was a lineal descendant of Richard Stockton, a signer of the Declaration of Independence, and of Commodore Stockton, U. S. N. He leaves a widow and two children.

OFFICIAL OF AN AKRON ESTABLISHMENT.

A. L. Neiswanger, vice-president of the India Rubber Co., Akron, Ohio, was fatally injured in a street car collision in that city, July 3. He was born and reared in Orrville, Ohio, 40 years ago. He is survived by a widow, two brothers and a sister.

TRADE-MARK DECISIONS.

A. A. WATERMAN & CO., v. L. E. WATERMAN COMPANY. A history of the litigation regarding the use of the name "Waterman" by makers of fountain pens would fill several columns. The latest decisions include that in a suit in the New York Supreme Court, and in an appeal in the Appellate Division of the court. The former was instituted by Isaac E. and William L. Chipman, doing business as A. A. Waterman & Co., to restrict the L. E. Waterman Co. from interfering with their rights in the use of the words "A. A. Waterman & Company" and from bringing any suit for damages or injunction against any person by reason of the manufacture or sale by such person of any fountain pen bearing these words. The Court ruled in favor of the plaintiffs, provided, however that the words "Not connected with the L. E. Waterman Company" were added to the words "A. A. Waterman & Company." An appeal was taken by the L. E. Waterman Co. and the Appellate Division of the Court reversed the above ruling. [Trade-Mark Bulletin, May 1, 1917.]

EX PARTE, THE MILLER RUBBER CO. The goods sought to be covered by one registry include virtually everything made of rubber as, for example, vehicle tires, bathing caps, rubber heels, rubber tubing, barber's bibs, balloons and rubber sponges among others. Obviously these could not all be included in any existing class of goods; the applicant's virtual proposition is that a new class of goods could be formed to include everything made of rubber and it points out certain undoubted hardships in having to make several registrations at heavy expense. The convenience of the applicant cannot be paramount to the convenience of the public. The applicant does not make rubber, but various articles of rubber. If the applicant wishes to use the same mark on tires and on bathing caps, it must make separate registration; there is no possible way to avoid it. [Trade-Mark Bulletin, June 1, 1917.]

STORK CO. VS. STERLING CO. The defendant company applied for registration for maternity frocks, a design representing two storks holding a banner bearing the words "La Mere." The plaintiff filed an opposition as owner of a trade-mark of the same description except with the name "Stork" in place of "La Mere, "for waterproof fabrics and articles made therefrom. [Trade-Mark Bulletin, May 1, 1917.]

EX PARTE L. CANDEE & CO. The trade-mark "Unika" was refused registration on the ground that it is similar to the previously registered "Unico" trade-mark for boots and shoes. This latter trade-mark, however, was registered for leather boots and shoes, and the decision is that reference be withdrawn and trade-mark allowed. [Trade-Mark Bulletin, May 1, 1917.]

BOSTON RUBBER SHOE CO. v. ABRAMOWITZ. An interference proceeding where application was made to register the words "The Hub" with a picture of a hub between them for leather shoes. Another applied for registration of the word "Hub" as a trade-mark for shoes with canvas uppers and leather or rubber soles. The latter could show no proof of use except on tennis shoes with leather insoles and on rubber shoes. Hence the commissioner decided there could be no interference. [Trade-Mark Bulletin, May 1, 1917.]

EX PARTE, INDIA RUBBER, GUTTA PERCHA & TELEGRAPH WORKS, LIMITED. The trade-mark "Silver King" for golf balls was rejected because of prior registration of the trade-mark "King" for the same goods. The commissioner held there was no likelihood of confusion, as the word "Silver" is the most prominent part of the proposed trade-mark and it has a suggestiveness different from the word "King." [Trade-Mark Bulletin, June 1, 1917.]

THE GOODYEAR TIRE & RUBBER CO. v. THE FIRESTONE TIRE & RUBBER CO. The Firestone company filed on November 4, 1915, an application for registration of a trade-mark for rubber tires and casings for vehicles, originally said to consist in a black tread and red side walls, but later defined as a circumferential band of black intermediate between two circumferential bands of red, disclaiming the picture of the tire itself. The application was rejected on reference to registration No. 85,434 to the Goodyear company, dated February 20, 1912, of a central circumferential band or stripe of blue; but on argument that rejection was withdrawn. Upon allowance and publication an opposition was filed by the Goodyear company and sustained, from which ruling appeal is taken by the Firestone company.

Assistant Commissioner Clay in his argument sustaining the decision of the Examiner of Trade-Marks, concludes as follows:

"Broadly considered, I think the applicant's mark fails to come within the proper definition of a trade-mark, and especially it is not a 'mark by which the goods of the owner of the mark may be distinguished' in the sense of the Trade-Mark Act." [Decisions of the Commissioner of Patents, May 22, 1917.]

CUSTOM HOUSE DECISION.

CRUDE CHICLE. The Board of General Appraisers sustained the protest of Schutte, Bunemann & Co., New York City, regarding the assessment of duty of 20 cents per pound as refined chicle. Claim was entered that it was crude chicle and dutiable at 15 cents per pound, in accordance with another provision of the same paragraph of the tariff act. On the authority of Abstract 39,077 the chicle in question was held dutiable at 15 cents per pound, under paragraph 36 of tariff act of 1913.

S. A. E. SUMMER MEETING.

THE summer meeting of the Society of Automotive Engineers, held June 25 and 26 at the Bureau of Standards, Washington, D. C., with headquarters at the New Willard Hotel, was an important one devoted almost exclusively to war needs. Monday was devoted to the standards committee, several divisions of which, including those devoted to aeronautics, electrical equipment, lighting and starting batteries, reported. Tuesday's program included the business and professional session, with reports of officers and miscellaneous business, discussion of the reports of the standards committee, and the reading of the following papers:

Building Submarine Chasers by Standardized Methods, by Henry R. Sutphen. (Illustrated by motion pictures.)

The Farm Tractor as Related to the Food Problem, by H. L. Horning. (Illustrated by motion pictures.)

Design and production of Aircraft in War Time, by Wing Commander I. W. Seddon, of the British Commission.

Classes and Uses of Battleplanes, by Lieut. Amaury de la Grange, of the French Commission.

Fundamentals of a Successful Kerosene-Burning Tractor Engine, by C. E. Sargent.

LESSONS OF THE WAR IN TRUCK DESIGN.

The paper "Lessons of the War in Truck Design," by W. O. Thomas, was particularly pertinent at this time and offered many valuable suggestions based on actual war experience, among which those relating to tires are of interest. He said:

All trucks sent from Canada were fitted with demountable tires on standard S. A. E. rims. This was decided upon before the British had adopted the American pressed-on type with a view to easy replacement in the field. Two makes were used in approximately even quantities. On both makes the locking rings and bolts and nuts were thoroughly vulcanized. Most of the tires were carefully shipped fitted with wooden center struts to prevent distortion of the rims. Ample spare tire parts of all kinds were supplied.

The subsequent use of these tires on the muddy roads in Flanders showed that they were much more difficult of replacement than the pressed-on type which is now standard on all British trucks. After the tires had been in use for some time in the mud they were removed only with the greatest difficulty, and once the rims had become rusted it was often impossible to remove them, even in a tire press. The most effective way was to take out the remnants of the rubber and to jar and expand the rims with a sledge hammer.

The tires of the pressed-on type, on the contrary, were easily applied and removed in a tire press, which was always to be found at every tire store. Tire presses also were fitted on railway cars, which were always available at railhead points with a stock of tires. As the main function of the motor trucks was to ship material and supplies from these same railhead points this method of replacement was a very simple matter.

Spare wheels with tires applied were always available at more advanced points, but these were necessary in any case to guard against the breakage of wheels and were easily used if there should be an emergency case of tire trouble in the field. Tires were almost universally pressed on with burlap strips. This was at first criticised, but it did not appear to cause any trouble, as with the general muddy condition it probably aided in the quick rusting on of the tire.

The standardization of the pressed-on type of tire on S. A. E. rims cannot be too strongly recommended. I am satisfied that the demountable type will be found wanting in war service in France.

ADVANTAGE OF SINGLE TIRES.

It is advisable to limit the number of sizes of tires to as few as possible. It is possible to use 5-inch for front wheels of all trucks, because the smaller trucks are naturally faster moving and the additional speed will easily make the wear even. In France a great many of the trucks are used with 5-inch dual tires on rear wheels. These developed serious troubles on account of the load often being concentrated on one of the tires only. On the granite block roads a projecting block on a damaged road would often cut out a large section of one of the tires. On heavily cambered roads the weights would concentrate on the inside tires. I am convinced that the wider-section single tires on rear wheels suffered less damage from these causes than the dual tires. I believe that tires with a slightly convex tread give better service than absolutely flat-tread tires. Many of the tires sent from America to France appeared to be over-cured. In general they were harder and more liable to crumble than the European tires. On the other hand, many of more resilient tires gave trouble near the base and became detached from the steel ring.

TIRE AND RIM RECOMMENDATIONS APPROVED.

The carrying capacities and inflation pressures of pneumatic tires recommended by the Tire and Rim Division, as published on page 579 of our July issue, were approved by the Society.

THE JOURNAL OF THE S. A. E.

"The S. A. E. Bulletin," published for several years past, has been discontinued and replaced by "The Journal of the Society of Automotive Engineers," printed in the standard technical size, 9 by 12 inches, and is a credit to the organization.

MOTOR-CYCLE STANDARDIZATION UNDER WAY.

Another division was added to the standards committee of the S. A. E. when, at the request of the Ordnance Department, the members of the Motorcycle and Allied Trades Association joined the S. A. E. to carry its standardization work into the motor-cycle industry.

Motor-cycles for dispatch riders, transporting machine guns on side cars, and many other purposes are playing a conspicuous part in the war, and the need for standardization of detail dimensions of parts has constantly been becoming more obvious. A study is now in progress looking toward the formulation of a standard set of specifications to be used in the purchase of military motor-cycles. Typical machines are being examined and sub-committees have been appointed to report on the parts that can be standardized.

At a meeting of the temporary motor-cycle division of the standards committee on June 28 it was decided to standardize tires, rims, spokes, headlamp mountings and supports, chains, throttle control, clutch and brake pedals. Other items may be standardized at an early date. It was decided that both the front and rear wheels of the motor-cycle and the wheels of the side and rear car are to be alike and to carry the same rims and size and type of tire. Tire and rim specifications follow:

TIRES. All tires of military motor-cycles, side cars and rear cars are to be of the clincher type, 28 by 3 inches in dimension.

RIMS. All rims for military motor-cycles are to be made for 28 by 3 inch clincher tires and have the standard cc., with forty spoke holes, 17/64 inch in diameter, suitable for ¼ inch spokes.

AMERICAN CHEMICAL SOCIETY.

THE program of the meeting of the American Chemical Society, to be held at Massachusetts Institute of Technology, Boston, Massachusetts, September 10 to 13, will include a general conference on "Chemistry in Warfare," opened by William H. Nichols, chairman Committee on Chemicals, Council of National Defense, and Marston J. Bogert, chairman Chemistry Committee National Research Council.

At the divisional meetings there will be conferences on "The Supply of Organic Chemicals for Research During the War" and "The Industrial Chemist in War Time."

The special committee appointed to lay definite recommendations before the Federal authorities that chemists be used for chemical service during the war, finds that the government has decided against any general class exemption. It is therefore recommended that chemists who may be drafted present facts of their education, experience and employment to local boards, with the request that they be allowed to continue at their present work, or in default of this, be detailed to serve as chemists in the military branch of the government.

The purpose of this recommendation is to put into the possession of the government authorities all the facts necessary for it to decide exactly for what service a given man is most fitted.

News of the American Rubber Trade.

FISK BUYS THE GIBNEY TIRE.

ON July 9 the United States District Court of Philadelphia, Pennsylvania, authorized the receiver, Henry C. Thompson, Jr., to consummate the offer of The Fisk Rubber Co., Chicopee Falls, Massachusetts, for the plant and all the assets of the Gibney Tire & Rubber Co., Conshohocken, Pennsylvania. The purchase price is about $410,000, subject to such adjustments as may occur by reason of the closing of the books on July 9.

The Gibney solid tire has a reputation and trade name of considerable value, but the company lacked adequate capital in an enterprise requiring large amounts of money, and unwise purchases of crude rubber during a war-brought rubber trade flurry had further weakened its financial standing. In purchasing this property. the Fisk company assures the financial stability of the business and acquires a trade name and volume of production that will prove of distinct advantage in developing the sale of its own solid tires. Henceforth the Gibney tires will be manufactured on a much larger scale than in the past, a triple or even quadruple production being promised to consumers and the trade. The big Fisk solid tire unit at Chicopee Falls, Massachusetts, will also be put into operation as soon as possible. It is designed to have an output of 2,000 tires a day, making it one of the largest solid tire departments in the country.

Fortunately, the Gibney service stations in a number of cities, including New York City and Philadelphia, Pennsylvania, do not conflict with the Fisk branch system, and they will be retained practically intact, as will the Gibney organization, except that James G. and John Gibney have resigned. The increased output, however, will be marketed not only by the Gibney system, but by the more than 125 sales branches of the Fisk company, thus placing the latter in a stronger position as a distributer of solid tires.

CARLISLE WANTS A RUBBER FACTORY.

According to the Chamber of Commerce of Carlisle, Pennsylvania, a careful investigation by experts employed by that body results in a report that Carlisle is one of the best places in the country in which to locate a rubber factory, because of its location and railroad connections, its very dry atmosphere and its excellent water supply. Following this report, the Chamber of Commerce is endeavoring to induce some live, active rubber concern to locate there, and is ready to offer free factory site, low cost electric power, and financial assistance if necessary, to such a concern. Moreover, it is stated that there are many men living in Carlisle who are skilled in rubber working, having been employed at one time or another in rubber factories.

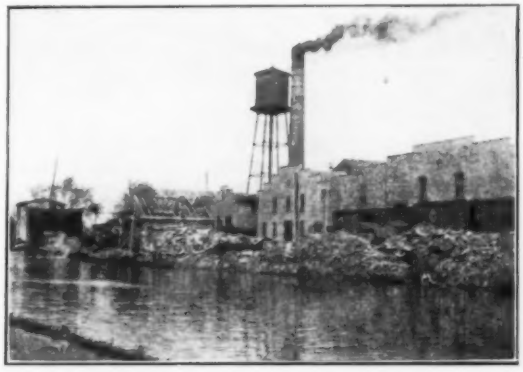
RUBBER COMPANY SHARE QUOTATIONS.

The following market quotations of shares of rubber manufacturing companies on July 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago, Illinois.

	Bid.	Asked.
Ajax Rubber Co. (new)	66½	7½
Firestone Tire & Rubber Co., common	118	21
Firestone Tire & Rubber Co., preferred	103	6
The B. F. Goodrich Co., common	49	50
The B. F. Goodrich Co., preferred	104	6½
Goodyear Tire & Rubber Co., common	197	201
Goodyear Tire & Rubber Co., preferred	105	7
Kelly-Springfield Tire Co., common	46	7½
Kelly-Springfield Tire Co., preferred	88	95
Miller Rubber Co., common	175	85
Miller Rubber Co., preferred	102	4
Portage Rubber Co.	150	54
Swinehart Tire & Rubber Co.	59	65
United States Rubber Co., common	60⅛	60⅞
United States Rubber Co., preferred	105	108

SOMERSET RUBBER RECLAIMING WORKS.

One of the busy spots in the rubber industry of New Jersey is the factory of the Somerset Rubber Reclaiming Works at New Brunswick, shown in the accompanying illustration. The plant is running day and night with orders enough for some time to come, many of them for special reclaimed stocks to go into government work for the rubberizing trade. The present capacity



SOMERSET RUBBER RECLAIMING WORKS PLANT

averages about one car of reclaimed rubber a day. New machinery is gradually being added, however, and new buildings are being erected. The laboratory is already one of the most complete of its kind, equipped with machinery of many sorts and supplemented by an analytical department.

Negotiations are in progress for the purchase of properties for the housing of employes, and a new lunch room is in course of construction near the factory to provide restful accommodations where the men can eat their own lunch while a Victrola is being played. Additional shower baths are being installed, which are much appreciated.

OPEN BRANCH OFFICES.

Stresen-Reuter & Hancock, Inc., dealers in colors and chemicals, Chicago, Illinois, have opened offices at 292 Pearl street, New York City, 418 New Market street, Philadelphia, Pennsylvania, and 82 Richmond street, East, Toronto, Canada. Stocks will be carried at these branches, as at the Cleveland, Ohio, branch of this concern.

RUBBER COMPANY DIVIDENDS.

The Boston Belting Co. paid a quarterly dividend of $2 per share on July 2 to stockholders of record June 21.

The Eagle-Picher Lead Co. paid a quarterly dividend of 1½ per cent on preferred stock on July 16 to stockholders of record July 5.

The board of directors of the United States Rubber Co. has declared a quarterly dividend of 2 per cent on first preferred stock, payable July 31, to stockholders of record July 20.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of $1 per share on common stock, payable August 1 to stockholders of record July 16.

The Portage Rubber Co. has declared a quarterly dividend of 3 per cent on common stock, payable August 15 to stockholders of record August 5. This dividend raises the stock from a 10 to a 12 per cent basis.

UNITED STATES RUBBER CO. PROMOTIONS.

On July 2 an announcement was sent out by the United States Rubber Co., New York City, stating that W. E. Barker had resigned as manager of sales of the footwear division in order to take up other important duties for the company. The following changes were also announced in the footwear division:

George H. Mayo is appointed manager of sales of this division of the company's activities. Charles W. Barnes becomes general selling agent, and R. F. Spencer is now manager of credits.

Mr. Barker has been connected with the rubber trade during his entire business life, starting with Charles M. Clapp & Co., Boston, Massachusetts, in 1882, and advancing steadily to the position of manager of sales. In 1889 he became selling agent for the Para Rubber Shoe Co., Boston. Three years later he organized the Enterprise Rubber Co., Boston, and for over 20 years was its president. When the office of merchandise manager of branch stores was created by the United States Rubber Co. in 1909 he was the first to fill that position. Four years later Mr. Barker was appointed to the office of manager of sales when that position was made vacant by the death of E. R. Rice. It is from this position that Mr. Barker has just resigned to take up other duties for the company. That he is fully equipped for any service to which he may be called is evidenced by this brief sketch of his experience in the rubber business.

George H. Mayo, who succeeds Mr. Barker as manager, though a younger man, can boast of nearly a quarter century in the rubber footwear business. Starting at the age of 19 in the wholesale house of Wm. H. Mayo & Co., of which his father was the head, he became a junior partner five years later, just about the time when this firm discontinued its leather footwear business and devoted its entire attention to the sales of the imperfect and out-of-date goods of the United States Rubber Co. He succeeded Mr. Barker as merchandise manager of branch stores in 1913, and following closely, he now succeeds him as manager of sales. His steady, upward climb is the best proof of his fitness for his new position.

Charles W. Barnes has been connected with the United States Rubber Co. interests throughout his entire business life. On his graduation from the English High School of his native city, Boston, in 1885, he entered the employ of the American Rubber Co., then an independent company. When this company became a part of the United States Rubber Co., in 1893, he took an important position in the Boston office, giving special attention to the goods made at the American factory. Ten years later he was called to the New York office, where he has had special work to do, his immediately previous position being assistant to manager of sales, from which he has just been called to the office of general selling agent of the footwear division.

Richard F. Spencer's business life has always been associated with merchandising. Starting in a general store in 1867, he secured a position nine years later in the wholesale dry goods house of Crow, Hargadine & Co., St. Louis, Missouri. In 1881 he joined the force of Hamilton, Brown & Co., wholesale shoes and rubbers, St. Louis, and in 1888 was elected secretary and treasurer of the Hamilton-Brown Shoe Co., resigning from that position in 1910 to go with the United States Rubber Co. as comptroller, which office was a stepping stone to his new position.

WILLIAM E. BARKER. GEO. H. MAYO. CHARLES W. BARNES. RICHARD T. SPENCER.

OFFICIALS RECENTLY PROMOTED IN FOOTWEAR DIVISION, UNITED STATES RUBBER CO.

NEW U. S. RUBBER COATED FABRIC FACTORY.

The United States Rubber Co., New York City, has taken over the plant of the Milford Straw Hat Works, at Milford, Connecticut, for the manufacture of coated fabrics, and articles made therefrom. The company has been making a variety of these fabrics, some so closely resembling leather that they are being used extensively for automobile tops and upholstery work. The new factory is now being equipped with mills, spreaders, vulcanizers, etc., and also with machinery and appliances for the manufacture of traveling bags of this new fabric. It is contemplated that the company will also make here army blankets, ponchos and other equipment for the United States Government. The factory has a floor area of nearly 75,000 square feet, and there is enough adjacent land to allow expansion. About 400 to 500 hands will be employed, the work to be under the supervision of the Goodyear's Metallic Rubber Shoe Co., Naugatuck, Connecticut. J. Wallace Harney, formerly with the L. Candee & Co., New Haven, Connecticut, is the local superintendent of the new factory.

GLOBE RUBBER TIRE MANUFACTURING CO.

J. B. Linerd, general sales manager of the Globe Rubber Tire Manufacturing Co., New York City, is planning an intensive national sales campaign for its hand-made tires. The plant at Trenton, New Jersey, was originally a part of the United & Globe Rubber Manufacturing Cos. of Trenton, New Jersey, but was purchased in its entirety by the Globe Rubber Tire Manufacturing Co., and since has been entirely independent of and has no connection whatever with the former company. Harry B. James was elected president, Henry L. Joyce, vice-president, and J. P. Hall, secretary and treasurer. The executive offices are at 1851 Broadway.

PACKING PLANTATION RUBBER.

RESPONDING to the activities of the Rubber Association of America, which placed the data and suggestions it had gathered regarding improved packing of plantation rubber at the disposal of the Rubber Growers' Association in London, the latter body has issued a circular to its members drawing particular attention to the following points:

THREE-PLY CASES. It is evident that three-ply cases are the most suitable for carrying rubber, provided they are assembled and closed strictly in accordance with the makers' instructions. Estate managers appear to think that the patent fasteners provided by the makers are not sufficiently strong and that nails must be driven in after the cases are closed in order to ensure safety of the contents. This is wrong and is responsible for serious complaints of bad-outturn, particularly when the rubber has to be opened up for inspection in London and/or New York before being sent on to the manufacturers.

MOMI CASES. Well-seasoned Momi cases, if properly hooped, appear to be satisfactory, but they do not stand transhipment well unless fully ⅝-inch thick after being planed (¾-inch before planing). The importance of using only cases which are sufficiently strong and well put together to ensure safe arrival of the contents does not appear to be sufficiently appreciated, and members are advised to pay whatever additional cost is necessary in order to secure packages that conform to requirements.

CHIPS AND SPLINTERS. All the manufacturers concur in complaining of chips and splinters getting into the rubber. Estate managers realize how important it is to clean the inside of the cases thoroughly before packing, but after the rubber is packed it apparently contracts until there is a certain amount of play inside the case, which results in splinters and particles of wood fraying off during transit and becoming embedded in the rubber. These are very difficult to remove.

It is essential that the rubber should be spread evenly quite close to the sides of the case, which should contain as much rubber as can be packed without undue pressure. A suggestion made by several American manufacturers is that the cases should be lined with cheesecloth or jackinette. The cost is about ⅛*d.* per pound of rubber. This expedition is now under trial.

MARKING. Cases should be clearly marked: "Stow Away from Boilers."

After having been advised by members of the American rubber trade if crude rubber arriving from British possessions shows any improvement in packing and condition on arrival as a result of these suggestions, the Rubber Association of America purposes to communicate again with the Rubber Growers' Association, outlining to them the opinions of American manufacturers and importers in regard to the efforts thus far made to improve methods of packing and shipment.

CRUDE RUBBER RATES ATTACKED.

The Goodyear Tire & Rubber Co., of Akron, Ohio, and others have filed a case with the Interstate Commerce Commission against the Akron, Canton and Youngstown Railroad and others, alleging that the defendants exact second-class rates on less-than-carload shipments of crude rubber from New York City, and the Commission is asked to prescribe for the future the third-class rate on less-than-carload shipments, and fourth-class rate, with a minimum of 36,000 pounds per car, on carload shipments. Similar allegations are made by the Kelly-Springfield Tire Co., Cumberland, Maryland, and the Batavia Rubber Co., Batavia, New York, additional points of destination mentioned being Wooster, Ohio; Buffalo, New York, and Cumberland, Maryland, and in another case the La Crosse Rubber Co., La Crosse, Wisconsin, attacks the classification ratings on crude rubber from New York City and other points in official classification territory to La Crosse. These cases have not yet been assigned for hearings.

PERSONAL MENTION.

Paul Luce, Buffalo, New York, salesman for the Boston Woven Hose & Rubber Co., Cambridge, Massachusetts, and Miss Jennie Campbell, formerly in the office department of the same company, were married July 16 and will reside in Buffalo. Before entering the sales department some years ago, Mr. Luce was foreman of the rubber belt department at the Cambridge factory.

Ralph Starr Butler, professor of advertising and marketing at New York University, has been appointed to the development department of the United States Rubber Co., New York City, to gather and collate data on market conditions. This work was formerly handled by Ralph Nystrom, now with the Hearst forces.

Charles F. Pichon, salesman in the Detroit branch of the United States Rubber Co., has been elected Grand Counselor of the United Commercial Travelers of Indiana. He is the youngest man who has ever gone through the different offices of the Grand Lodge of that state. He has been a traveling salesman for 15 years.

T. W. McNeil, of the Dayton Rubber Manufacturing Co., Dayton, Ohio, has been selected as one of the 12 members of the board of governors for the new Community Country Club.

F. H. D. Kop, manager of the David Birnie Co., rubber, tobacco and coffee exporters of Java, has been visiting this country for the purpose of interesting rubber manufacturers in his product. Mr. Kop states that Java's present output of rubber is 320,000 tons a year. He also says that rubber formerly exported to Rotterdam and London will hereafter be shipped to America through San Francisco.

Arthur W. Stedman, manager of Hagemeyer Trading Co.'s crude rubber department, recently suffered a painful and what might have been a serious injury to his leg while playing golf. His many friends in the trade will be glad to know that he is on the road to recovery and attending to business as usual.

L. A. Duffy, of the Hagemeyer Trading Co., 17 Battery Place, New York City, crude rubber dealer, returned last month from a successful business trip that included Para, Manaos and Ceara.

Robert Allan, manager of the Para branch of the London & Brazilian Bank and well known in the Amazon rubber trade, arrived in New York City last month.

George L. Haenn, of Baltimore, Maryland, has been appointed to represent J. Early Wood, Inc., manufacturer and exporter of chemicals, in that vicinity.

Ralph Croft, crude rubber broker, New York City, has removed his offices from 12 Bridge street to 72 Trinity Place.

Clarence B. Clark, chemist of the Somerset Rubber Reclaiming Works, New Brunswick, New Jersey, was in attendance at the convention of the American Society for Testing Materials held in Atlantic City, New Jersey, during the last week of June at the Hotel Traymore.

Edward Hutchins, for the past six years supervising engineer for the Federal Rubber Manufacturing Co., Milwaukee, Wisconsin, has opened engineering offices in that city at 866 Superior street. He will specialize in the design and construction of rubber manufacturing and power plants, furnishing complete plans and specifications for the buildings and equipment, including machinery layouts for the most economical and systematic handling of the raw materials and the finished products. In experience, Mr. Hutchins is amply qualified, having been connected with Westinghouse, Church, Kerr & Co., engineers, New York City, for 13 years in the construction of various types of manufacturing and power plants and, later, construction engineer in charge of rebuilding the G. & J. Tire Co.'s plant at Indianapolis, Indiana.

TRADE NEWS NOTES.

W. H. Salisbury & Co., Inc., Chicago, Illinois, the oldest leather belting and general mechanical rubber goods house in the Middle West, has moved to more spacious quarters at 308-310 West Madison street.

The Hope Webbing Co. was recently incorporated in Massachusetts to take over the business of the Rhode Island corporation of the same name, having an extensive plant at Pawtucket, Rhode Island, where are manufactured tire tapes, elastic webbing, trunk straps, belting and narrow fabrics. The officers are Joseph B. McIntyre, president; Charles O. Horton, vice-president and general manager; Charles C. Marshall, treasurer; Attmore A. Tucker, secretary. Hayden, Stone & Co., New York City, is handling the 7 per cent cumulative preferred stock of the company.

A three-story brick building, 40 by 85 feet, is being erected by the H. O. Canfield Co., Bridgeport, Connecticut, manufacturer of mechanical rubber goods, to take care of its natural increase in business.

The L. A. Dreyfus Co., manufacturer of rubber specialties, Rosebank, Staten Island, New York, has increased its capital stock from $100,000 to $1,000,000.

The Massillon Rubber Co., Massillon, Ohio has increased its capital stock from $25,000 to $60,000 and is erecting a two-story brick building, 50 by 50 feet, to care for increased business in surgeon's gloves, druggists' sundries and toy balloons.

The Federal Rubber Co., Cudahy, Wisconsin, is completing a 300-foot ell on a recently erected six-story building in its plant, this addition increasing the capacity of the mechanical goods department about 40 per cent and that of the tire department about 30 per cent. New equipment has been ordered.

The Gillette Rubber Co., Eau Claire, Wisconsin, is installing a 1,000-horsepower boiler plant consisting of the most modern type of water-tube boilers and stokers, including a 175-foot brick stack and a coal-handling apparatus. Edward Hutchins is the construction engineer.

The natatorium at Kitchener, Ontario, built and furnished by President Reider of the Canadian Consolidated Rubber Co., Limited, was officially opened Saturday, July 21. Expert swimmers and divers gave exhibitions during the day and evening.

The Buffalo Foundry & Machine Co., manufacturer of rubber machinery, Buffalo, New York, will build a new pattern shop on Fillmore avenue.

The Warren Rubber Co., Warren, Ohio, has increased its capital stock from $80,000 to $100,000, in order to finance a steadily increasing business.

The National Surety Co. recently executed a schedule bond for the United States Rubber Co. for $5,613,000, which guarantees the honesty of approximately 2,700 of the company's employes both in this country and abroad.

The C. H. Gray Rubber Co., Dallas, Texas, selling agent for Hood tires, has moved its retail store into larger quarters in the Masonic building at Main and Pearl streets, where a thoroughly up-to-date service station is maintained with ten emergency cars at the call of customers day and night. This service and tire changes are absolutely free. The wholesale store of this company is located at 1926 Main street.

The La Crosse Rubber Mills Co., of La Crosse, Wisconsin, recently made a record shipment, 995 cases of rubber shoes weighing 26,000 pounds.

The Gustin-Bacon Manufacturing Co., Kansas City, Missouri, has just completed a fine service station, at a cost of $50,000, at McGee Road and 27th street, about half way between the residential district and the shopping section. Around this is an L-shaped open garage, which has been most advantageous for the tire service business, better than the old method of having car owners stop along the curbing. The company also maintains a road service, consisting of 11 Ford cars, each of which carries a stock of tires in assorted sizes, tubes, patches, etc.

An increase of 59 per cent in sales and 61 per cent in earnings for the six months ended June 30, as compared with the corresponding period of 1916, is shown by the Ajax Rubber Co., Inc., New York City. Net earnings were $1,257,461.

The business of the Indiana Rubber & Insulated Wire Co., Jonesboro, Indiana, has so expanded as to make a radical increase in floor space necessary. This company has always been one of the uniformly successful concerns of the industry.

CAPTAIN APPLETON, SECOND.

FRANCIS H. APPLETON, JR., son of Captain Francis H. Appleton of Boston, is himself a captain, having received his commission from Governor McCall. His command consists of 71 men all mustered in a part of the 67th of the Massachusetts State Guards. Young Captain Appleton has had considerable military training. He is a member of the Ancient and Honorable Artillery Co. of Boston, acting as Flanker for the commander. In the rubber trade his activities are well known in connection with various committees of the Rubber Association. He is also factory manager and treasurer for F. H. Appleton & Son, reclaimers, Boston and Franklin, Massachusetts. Of the same company William S. Goodwin, first lieutenant, Fred L. Tufts, corporal and three privates are also members of the Appleton force at the Franklin factory, and Lloyd E. Appleton, the secretary of the corporation, is a member of the Home Defense company at Rye, New York.

CAPTAIN FRANCIS H. APPLETON, JR.

HAWKEYE COMPANY EXPANDS.

The Hawkeye Tire & Rubber Co., Des Moines, Iowa, has added two Southwark heaters to its equipment, which will enable the company to increase its output to 600 tires a day, its previous quota being about 187 tires and 215 tubes.

It was the intention of this company to do only a local business and supply the various stockholder-dealers throughout the State of Iowa. However, it has been decided by the board of directors to increase the output and enter other territory for the distribution of its tires. Its first outside connection is with the Kissey Auto Supply Co., of Los Angeles, California.

PROBABLE MERGER OF REPUBLIC AND KNIGHT TIRE INTERESTS.

The controlling interest in the Knight Tire & Rubber Co., Canton, Ohio, has been acquired for the Republic Rubber Co., Youngstown, Ohio. It is understood that the "Knight" and "Blackstone" tires will be continued, and that a portion of the factory, after enlargement, will be devoted to the construction of Republic tires. Probably a new corporation will be formed, with a capital stock of $20,000,000, to acquire both plants, and make extensive additions and improvements.

NEW INCORPORATIONS.

Allied Rubber & Mica Co., The, January 13 (Ohio), $25,000. F. E. Driffield (president and manager); Charles A. Driffield (vice-president and treasurer); Charles Olds and Mrs. F. E. Driffield, both directors. Warerooms, store and offices are located at 1430 West Third street, Cleveland, Ohio. To job mechanical rubber goods and electrical insulation, in the states of Ohio, Michigan, New York, West Virginia and Pennsylvania.

Ambrose Braid Co., Inc., July 14 (New York), $1,000. Henrietta Johnson, 300 E. Fifth street; Joseph Buhl, 1351 Gates avenue, and Chris Dalury, 801 Broadway—all in Brooklyn, New York. To manufacture elastic webs, etc.

Berkshire Rubber Co. of New York, Inc., The, July 9 (New York) $10,000. Albert Wurts, Pittsfield, Massachusetts, Burkhardt Wurts, 260 Central avenue, and Thomas D. McMurray, 292 Central avenue—both in Albany, New York. To manufacture rubber goods, etc.

Continental Plantation Co., July 16 (Delaware), $1,000,000. M. L. Gatchell, L. A. Irwin, Harry W. Davis—all of Wilmington, Delaware. Principal office in the State of Delaware is with the Registrar and Transfer Co., 900 Market street, Wilmington, Delaware. To explore for, manufacture and deal in gum, caoutchouc, gutta percha, etc.

Cooper Garage & Vulcanizing Works., Inc., June 26 (New York), $10,000. A. Stuart Cooper and Florence Cooper—both 95 Spaulding avenue, and Alfred Scrimshaw, 127 Spaulding avenue—all in Buffalo, New York.

Davenport Vulcanizer Manufacturing Co., April 2, (Iowa), $25,000. Thomas J. Gillaspy and A. D. Brownlie—both of Davenport, Iowa. Principal office, Davenport, Iowa. This company is the patentee and manufacturer of the Davenport Vulcanizer and its supplies, and also manufactures chemically treated strawboard for all makes of vulcanizers; rubber cement; raw rubber patches and semi-cured patches; always-tite cloth; back foolproof patches; the Gillaspy Sure Shot Manifold Heater and its supplies and the Davenport Vulcanizer Kit.

Delion Tire & Rubber Co., June 9 (Delaware), $3,500,000. John F. Neary, Herbert E. Latter, and Herbert H. Ward, Jr.—all in Wilmington, Delaware. Principal office in the State of Delaware is with the Corporation Trust Co. of America, Du Pont Building, Wilmington, Delaware. To contract for, purchase and deal in all kinds of rubber, automobiles, automobile parts, etc.

Demas Armor-Cased Tire Saving Co., July 2 (Delaware), $200,000. George H. B. Martin, Philadelphia, Pennsylvania; J. Vernon Pimm and S. C. Seymour—both of Camden, New Jersey. Principal office is with the Corporation Guarantee & Trust Co., Ford Building, Wilmington, Delaware. To manufacture and deal in tires, tire casings and shoes for use on automobiles operated by power.

Dittenhoefer Tube & Rubber Co., July 16 (Delaware), $1,000,000. Arthur W. Britton, Samuel B. Howard and John A. Moore—all of 65 Cedar street, New York City. Principal office in the State of Delaware is with the United States Corporation Co., 311 S. State street, Wilmington, Delaware. To manufacture and deal in motors, motor parts, tires and tubes of every kind and description.

Double Mileage Tire Co., The, June 19 (Texas), $5,000. J. N. Bolton, H. H. Rankin and P. H. Spiller—all of Houston, Texas. Principal office, Houston, Texas. To purchase and sell goods necessary in conducting an automobile selling business.

Endurance Tire Sales Co., Inc., June 23 (New York), $10,000. John Burlinson, 700 W. One Hundred and Seventy-ninth street; Philip R. Straus, 286 W. Seventieth street, and J. Stuart Elkin—all in Englewood, New Jersey. To deal in tires.

Erie Tire & Rubber Co., June 25 (Delaware), $10,000,000. A. W. Posey, E. G. Adams, H. Bonsall—all of Wilmington, Delaware. Principal office in the State of Delaware is with the American Guaranty and Trust Co., 206 W. Ninth street, Wilmington, Delaware. To manufacture and deal in automobile tires and all kinds of rubber goods.

Ganter Tire & Rubber Co., Inc., The, July 9 (New York), $2,000. William J. Breslin, 850 W. One Hundred and Seventy-ninth street, New York City; Edward J. Ganter and William V. Kiefer—both 251 S. Broadway, Yonkers, New York.

Goodyear Waterproof Co., The, June 22 (New York), $5,000. Barney Kimmel and Abraham Newman—both of 821 Broadway, and Alexander Weidman, 134 Eldridge street—all in New York City. Rubber apparel, etc.

Gregrea Manufacturing Co., Inc., June 26 (New York), $100,000. Andrew F. Rea, Toronto, Canada; F. Hammett Gregory, 320 Broadway, and Walter A. Van Ness, 220 Broadway—both in New York City. To manufacture rubber and rubber-like products.

Harvey Tire & Rubber Co., June 30 (Maine), $1,000,000. The directors are: George S. Soule (president), A. B. Farnham (treasurer), P. B. Drew and T. L. Croteau—all of Portland, Maine. To engage in the manufacture of tires and rubber goods.

International Life Suit Corporation, June 30 (New York), $3,000,000. Oscar A. Youngren, 11 Broadway; Louis F. Bruen, 330 West End avenue—both in New York City, and James A. Watt, 229 Elm street, Richmond Hill, Long Island. Principal office, New York City. To manufacture rubber life suits.

International Resilient Tire Co., June 18 (Delaware), $500,000. F. R. Hansell, Philadelphia, Pennsylvania; J. Vernon Pimm and S. C. Seymour—both of Camden, New Jersey. Principal office in the State of Delaware is with the Corporation Guarantee and Trust Co., 927 Market street, Wilmington, Delaware. To manufacture and deal in all kinds of tires, pneumatic airless, wheels and rims for automobiles, etc.

National Rubber Sales Co., July 5 (Indiana), $25,000. Elmer S. White, David R. Ulmer, Ethel M. White and Blanche A. Ulmer—all of Terre Haute, Indiana. Principal office, Terre Haute, Indiana. To buy, cover, recover and repair automobile, motor-cycle and bicycle tires and to buy and sell auto accessories.

National Synthetic Rubber & Tire Co., July 17 (Delaware), $1,000,000. Arthur W. Britton, Samuel B. Howard and John A. Moore—all of 65 Cedar street, New York City. Principal office in the State of Delaware is with the United States Corporation Co., Dover, Delaware. To manufacture and deal in all kinds of motors, engines, machines, etc.

Nebraska Tire & Rubber Co. of Omaha, The, July 2 (Nebraska), $500,000. E. G. Wolfe, G. C. Peironet, C. E. Niswonger, William A. Graham, Irving F. Baxter and G. W. Toman. To manufacture and sell automobile tires, tubes, casings and accessories.

Old Hickory Tire Co., June 26 (Delaware), $500,000. Charles H. Jones, W. I. N. Lofland, George W. Morgan—all of Dover, Delaware. Principal office in the State of Delaware is with the Capital Trust Co. of Delaware, Dover, Delaware. To manufacture tires, etc.

Pittsburgh Rubber Tire Manufacturing Co., July 9 (Delaware), $1,000,000. Wilber A. McCoy, Pittsburgh, Pennsylvania; Charles H. Jones, and W. I. N. Lofland—both of Dover, Delaware. Principal office in the State of Delaware is with the Capital Trust Co. of Delaware, Dover, Delaware. To manufacture, buy, sell and deal in automobile tires for automobiles, motor trucks and motor vehicles of any kind and description.

Seneca Rubber Co., Inc., July 18 (New York), $50,000. Herbert T. Auerbach, 854 Main street; Harold A. Forbes, 241 Maryland street, and Lillian B. Dietz, 40 Laurel street—all in Buffalo, New York. To manufacture rubber products.

S. & S. Rubber Co., Inc., June 30 (New York), $5,000. William Reidfeld, G. A. Cymberg and Leo Kraus—all of 299 Broadway, New York City. To manufacture rubber products.

Standard Asphalt & Refining Co., June 30 (Delaware), $5,000,000. James M. Satterfield, L. B. Phillips and J. B. Bailey—all of Dover, Delaware. Principal office in the State of Delaware

is with James M. Satterfield, Esq., Dover, Delaware. To buy, sell and develop all kinds and grades of gas, petroleum, etc.

Tennessee Tire & Supply Co., June 18, (Tennessee) $10,000. C. W. Parker, A. C. Mahan, Lee M. Ross, W. L. Smith and J. J. Bryant. Principal office, 400 N. Gay street, Knoxville, Tennessee. To handle a general retail business of auto supplies, tires, etc.

Tire Outlet Co., Inc., July 12 (New York), $1,000. Sydney Bernheim, 35 Nassau street, New York City; Catherine A. Weldon, 591 Seventh street, and Harry H. Jacobson, 55 Grand street —both in Brooklyn, New York. To manufacture tires.

Union Rubber Co., July 7 (New Jersey), $35,000. Oswald Nitschke, Ashwood avenue, John Hiller, Jr., Twenty-first street; Willima Pettit, Twenty-second street; Frederick Kautz, Twenty-second street—all in Kenilworth, New Jersey. Principal office, Michigan avenue and Boulevard, Kenilworth, New Jersey. To manufacture rubber products.

MUNGER WINS RIM DECISION.

THE suit of Louis de F. Munger against the Perlman Rim Corporation for infringement of the Munger Rim Patent No. 638,588 of December 5, 1899, has been decided in favor of the plaintiff by Judge Manton, who directed the defendant to account before a master that the plaintiff may recover a reasonable royalty under the rule established in Dowagiac Manufacturing Co. v. Union Plow Co. The validity of the Perlman patent is not affected by the decision. The defendant will appeal the suit.

In the opinion of Judge Manton, the Munger patent and Perlman rim alike employ a wedge to secure a tire-carrying rim under tension on a motor car wheel so that the rim shall hug the wheel tightly and be held firmly in position while at the same time it can be detached readily by freeing the wedge surface. The Munger patent, however, antedates Perlman's claims. It is understood that damages, estimated on a basis of reasonable royalty, as stated by Judge Manton, may be recoverable against other rim manufacturers for a period of about 5½ years preceding the expiration of the Munger patent on December 5, 1916. Munger claims that nearly 20 companies have manufactured about 5,000,000 rims infringing his patent, and will probably insist on $1.50 a set, Perlman's own valuation placed on Standwell rims, as the proper figure.

The Munger rim patent was issued in 1899 to the International Wheel & Traction Co., to which he had assigned his rights. The International lacked capital at the outset and the rims were made for a while by the Munger Vehicle & Traction Co. at New Brunswick, New Jersey. Litigation with the Rubber Goods Manufacturing Co. ensued, and the Munger rights next passed to the National Wheel & Traction Co. This was succeeded in 1902 by the Munger Automobile Tire Co., of Trenton. In 1915 the patent was assigned back to Munger individually.

Should the Munger decision be sustained by the United States Circuit Court of Appeals, the Munger patent would then head the list of wedged-on demountable rims. Meanwhile, however, Erle K. Baker, of the Universal Rim Co., is suing Perlman in Chicago, claiming violation of numerous patents covering the practice of mounting a rim upon a conical seat. Apparently the courts must decide what constitutes a wedge before the present complicated tangle of rim patents can be straightened out.

PERLMAN RIM CORPORATION MOVES HEADQUARTERS.

Alfred P. Sloan, Jr., president of the United Motors Corp., has taken over the management of the Perlman Rim Corp. He has selected Clarence M. Day as his representative in that company, and he has accordingly been elected as president. The head offices of the Perlman Rim Corp., heretofore maintained in New York City, have been removed to the plant at Jackson, Michigan, which will enable the new president to keep in close touch with the manufacturing end of this corporation.

FRANK E. TITUS.

FRANK E. TITUS, who has just been appointed assistant manager of the foreign sales department of The B. F. Goodrich Co., has shown a steady upward progress in responsibility ever since he entered the employ of that company in 1906. He is a young man, acknowledging July 22, 1884, as the date of his birth at Painesville, Ohio. After a grammar school education at Cleveland, Ohio, and a high school graduation at Bellevue, Ohio, he was employed by the Nickel Plate Railroad for three years and then for a single year with the Ohio Cultivator Co.

FRANK E. TITUS.

In December, 1906, he became clerk in the engineering department of The B. F. Goodrich Co. Four years later, he went to the Buffalo branch of that company as assistant to W. O. Rutherford, then the local Buffalo, New York, manager, but now general sales manager of the company.

Mr. Titus later was the man in demand. He was appointed manager at Denver, Colorado, only to return to Buffalo as operating manager. Then he was made manager of the Pittsburgh, Pennsylvania, branch in 1914, only to return to the Buffalo store and assume full management last year. Now that the foreign sales department of the company demands a man who has made good, who has been tried and proven, Mr. Titus is again promoted, and is made assistant manager of that department. His past record is an assurance of his success in his new position.

Mr. Titus is a member of the Rotary Club and the Buffalo Chamber of Commerce, in both of which he has always taken an active interest. He is also a Knight Templar and a "Shriner."

THE GOODYEAR'S NEW CANADIAN FACTORY.

The Goodyear Tire & Rubber Co., of Canada, Limited, Toronto, Ontario, has practically completed its new $1,500,000 factory at New Toronto, a suburb of the city. This is a four-story structure 560 by 100 feet, and has one of the most up-to-date power plants in Canada. This power plant has sufficient capacity for three more similar buildings, and the company has land sufficient for five more units, similar to the one now completed. This factory, which will soon be in operation, has a daily capacity of 3,000 automobile tires. All kinds of pneumatic tires—automobile, motor-cycle, bicycle and airplane—will be made. At the Bowmanville, Ontario, factory will be manufactured mechanicals, molded goods and shoe supplies.

PEARCE-ARROW'S NEW FACTORY.

The Pearce-Arrow Tire & Rubber Manufacturing Co., Philadelphia, Pennsylvania, is starting alterations in its newly acquired plant at Twenty-first and Clearfield streets in that city, and expects to begin manufacturing there some time before the first of next year. This plant, consisting of five communicating buildings of modern brick construction, will give the company a capacity of 1,000 tires a day.

THE CARLISLE CORD TIRE.

The Carlisle Cord Tire Co., Inc., notice of whose incorporation appeared in the June, 1917, number of THE INDIA RUBBER WORLD, will soon put upon the market a cord tire, the invention of F. B. Carlisle, not only novel in itself but made upon equally ingenious yet simple machines designed and constructed by the same inventor. The carcass is made from cotton cord of large diameter, having a tensile strength of 235 pounds. Each cord is surrounded with rubber, which, it is claimed, almost entirely eliminates internal friction. The tread is novel, consisting of two parallel depressions resembling zigzag streaks of lightning, which provide effective non-skid qualities.

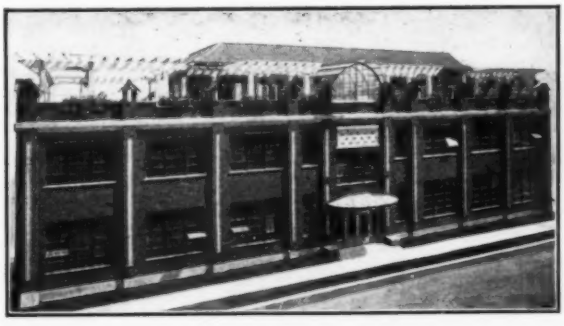
The company has secured an entire floor in the fine tire factory of the Tyer Rubber Co., Andover, Massachusetts, where the cord-laying machines are already at work. The vulcanizing is being done by the Tyer Rubber Co., but all other details of construction are entirely separate and distinct from the latter named concern.

The officers of the Carlisle company are: President J. S. Bretz; vice-president, F. B. Carlisle, the inventor; treasurer, Frank Williams, president of the Broadway Central Bank, New York City, and secretary, Frank A. Searles. The general sales manager is Charles A. Gilbert, formerly Pacific Coast manager, United States Tire Co. The principal office is at 250 West Fifty-fourth street, New York City.

THE ROOF GARDEN OF THE COLORADO TIRE & LEATHER CO.

On the evening of June 25 the new roof garden of the Colorado Tire & Leather Co., Denver, Colorado, was opened by a formal dance given by the Executive Club, which is composed of department managers and their first assistants. Speeches were made by officers of the company.

The roof garden was constructed at a cost of approximately $15,000, and is intended primarily for the social entertainment of employes of the company and their friends. It also affords



an opportunity to obtain well-cooked food practically at cost.

Bert Rhoads, architect for the company, worked out the design. The entrance is surmounted by a glass canopy and a large summer house, to be used as a banquet hall, ball room and lunch room, is the principal feature of the scheme. Swings, rustic benches and tea tables invite relaxation during the lunch hour and also evening amusement if desired.

NEW FISK BRANCH AT NASHVILLE.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, is to erect a handsome permanent branch in Nashville, Tennessee, on Eighth avenue, north, and extending through to Ninth avenue. The plans being prepared by Marr & Holman, architects, call for a sales and stock room and also a service station, to be equipped with all modern machinery necessary for repairing tires. The building will be of tapestry brick and thoroughly up to date in every particular. W. E. Cunningham is local manager for the Fisk company.

PERSONAL MENTION.

W. H. Taylor, of Chicago, has become resident manager of the Peoria, Illinois, branch of the United States Tire Co. Mr. Taylor was formerly engaged in specializing among jobbers for United States tires.

William Jameson, assistant superintendent of The Fisk Rubber Co., Chicopee Falls, Massachusetts, has presented the Chicopee Public Library with a magnificent mounted moose head which has been placed in a prominent place in the children's room.

Mark W. Roe, who has just resigned as mechanical and efficiency engineer for the McGraw Tire & Rubber Co., East Palestine, Ohio, to accept a similar position with the Republic Rubber Co., Youngstown, Ohio, has been connected with the rubber industry since 1906, when he became mechanical engineer for the Diamond Rubber Co., Akron, Ohio. He graduated from Cornell University in 1896 and for two years was an assistant instructor there, the next seven years serving engineering and textile concerns, an experience well fitting him for his later work in the rubber industry.

A. T. Severs, formerly assistant manager of the Minneapolis, Minnesota, branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been appointed manager of the Fargo, North Dakota, branch, succeeding W. R. McCarthy resigned.

R. T. Jollie, Jr., has been appointed supervisor of the Ajax Rubber Co., New York City, in Ohio, West Virginia and Kentucky.

B. F. Wulff, formerly connected with the San Francisco and later with the Chicago branch of The Kelly-Springfield Tire Co., has severed his connection with that company to become associated with the McCreary Tire & Rubber Co., Indiana, Pennsylvania, as manager of their sales department.

Robert Cartmell, who has made an enviable record in the Los Angeles, California, branch of the Kelly-Springfield Tire Co., New York City, has been placed in charge of the sales of solid truck tires at the general sales offices of the company, Cleveland, Ohio, where he will work with general sales manager Otis R. Cook.

Charles Schoneman, who has done excellent work in Hackensack, New Jersey, and Baltimore, Maryland, also more recently as division manager, for the Sterling Tire Corp., Rutherford, New Jersey, has been appointed manager of the new Chicago, Illinois, branch of that company.

L. W. Santasiere, formerly with the New York branch of the Firestone Tire & Rubber Co., Akron, Ohio, has been appointed a foreign traveler for the company. He sails shortly for the West Indies, where he will do general sales promotion work.

R. W. Brouse, formerly assistant manager of the Philadelphia (Pennsylvania) branch of The B. F. Goodrich Co., has been promoted to the managership of the company's branch at Buffalo, New York.

IMPERIAL BELTING CO. PROMOTIONS.

Harry E. Dennie, for several years Pacific Coast manager of the Imperial Belting Co., Chicago, Illinois, has been appointed general manager of the company.

W. S. Bloomer, formerly special representative throughout the Western States, has been appointed general sales manager.

Both were originally Chicago men who will be welcomed to their former fields of operation by many friends in the trade. The transfers were made necessary by the rapid expansion of the business and the determination to render the same painstaking service which their many satisfied customers have received in the past.

ACCORDING TO THE "NEW YORK SUN" THE NEED OF RUBBER IN Germany for the uses of war has become so great that even billiard tables are being stripped of their cushions.

TRADE NEWS NOTES.

Charles A. Be Saw, president, and P. P. Parker, general sales manager, of the Be Saw Tire & Rubber Co., have opened temporary offices in the Whittington Hotel, Ardmore, Oklahoma, near the site selected for the new tire factory, contracts for which have been let.

The Ideal Tire & Rubber Co., Cleveland, Ohio, has secured a plot of about 15 acres, in that city, with a good water front and adjoining two railroads. A factory will be erected large enough to turn out 500 casings and 800 tubes per day. The contract for this building has already been awarded.

A conference of division managers of the Marathon Tire & Rubber Co. was held the first week of July at the home office, Cuyahoga Falls, Ohio, to consider taking care of greatly increased business and the national advertising campaign the company is about to launch. H. H. Replogle, manager of sales, gave a dinner to the division managers in conference. The spirit of an unmistakably live and energetic organization was very evident.

A factory for the Crown Tire & Rubber Co., Ralston, Nebraska, is being erected, and it is expected that one floor will be ready for use about August 15. Meanwhile, Crown Cord tires and tubes are being made in a temporary plant. As the business grows, enlargements are to be made to the new plant, according to well defined plans already drawn which contemplate several wings.

The Norwalk Tire & Rubber Co., Norwalk, Connecticut, by leasing the Ash hat factory in South Norwalk, has made it possible to more than double the production of Norwalk tires without waiting for building operations. This arrangement, together with the large addition to the Norwalk plant, now in course of construction, is expected to treble the output next year.

The Lee Tire & Rubber Corp., Conshohocken, Pennsylvania, has developed a cord tire embodying its well-known puncture-proof feature and arrangements are now being made to manufacture them largely for the 1918 output. John Kearns, general manager, expresses the utmost confidence in cord construction and is of the opinion that by 1919 tire manufacturers will be making cord types of tires in greater quantities than the regular fabric type.

Eddie Lingenfelder and Fred C. Rounds are operating an automobile accessories business under the name of Eddie Lingenfelder Co., at 831-3 South Olive street, Los Angeles, California. The store is a Goodyear Service station.

The Cleveland Standard Tire & Rubber Co., notice of whose incorporation appeared in the July issue of THE INDIA RUBBER WORLD, acts as Southern California agent for the tires of the Standard Tire & Rubber Co., of Willoughby, Ohio. The office is located at Pico and Hill streets, Los Angeles, California, officers of the company being as follows: H. M. Lieb, president; E. B. Conlee, vice-president and general manager; E. Leon Sprague, secretary.

The Knight Tire & Rubber Co., Dallas, Texas, has removed to new quarters on Commerce Street.

The Giant Tire & Sales Co., Rochester, New York, expects to have its new Giant tire on the market within the next few months. The company was incorporated in April for $10,000.

The Perfection Rubber Works, Stamford, Connecticut, has taken a five years' lease of a three-story factory building on Garden street, and will commence manufacturing as soon as the necessary machinery can be installed.

The Boone Tire & Rubber Co., Sycamore, Illinois, has awarded the contract for the erection of the first unit of a third plant to be located at Chippewa Falls, Wisconsin, to cost about $125,000 complete. Work is already under way and it is hoped to get the plant into operation on August 15 or September 1. The building will be 100 by 200 feet, one and two stories. Electric motors aggregating more than 300 horse power are to be installed. The main plant of the company is located at Sycamore, Illinois, and a second plant at Des Moines, Iowa.

NEW PORTAGE RUBBER CO. BRANCHES.

B. J. Wildman, who has been made Pacific Coast manager for the Portage Rubber Co., recently opened two direct branches that will be operated under the name of the California Corp., and are located at 855 Traction avenue, Los Angeles, California, and 745 Mission street, San Francisco, California.

The Portage Rubber Co. also operates direct branches at Boston, Massachusetts; New York City; Philadelphia, Pennsylvania; Detroit, Michigan; Cleveland, Ohio; Atlanta, Georgia; Chicago, Illinois, and Des Moines, Iowa.

John H. Diehl is no longer connected with the company and his successor has not yet been appointed.

KELLY-SPRINGFIELD CUMBERLAND PLANT IN PROGRESS.

Final plans have been completed for the new Cumberland, Maryland, plant of the Kelly-Springfield Tire Co., New York City, which is now in process of erection at a cost of between $4,000,000 and $5,000,000. The location was chosen as a result of the tempting offer of the land, a bonus of $750,000 and ten years' tax exemption. The new plant will employ between 3,000 and 5,000 persons at the start and will have a capacity at least double that of the existing plants, including that acquired two years ago at Wooster, Ohio, and that bought early this year at Buffalo, New York.

The company has never attempted quantity production, but the increasing demand for Kelly-Springfield tires has made this important expansion necessary. Never in its history has the company been so far behind on its orders. Gross and net are both showing very large gains over the year to December 31, when a balance of 39 per cent remained for the $4,907,000 common stock after preferred dividends had been deducted. It is now paying 16 per cent, or $4 per share, and officials believe it will earn very close to 50 per cent this year.

RACINE AUTO TIRE CO.

The daily production of this firm at Racine, Wisconsin, is to be raised to 7,500 Horseshoe tires and tubes by the erection of new buildings and increase of the force to between 3,000 and 4,000 persons. The new plant will occupy a plot 260 by 320 feet, will be five stories high, and divided into units 60 feet wide with courts 30 feet wide between sections. Reinforced concrete will be used, and the latest machinery and electrical equipment will be installed.

This growing firm began business seven years ago with three workmen and has practically trebled its output in each of the past three years, sales up to June 1, of this year, being 20 per cent greater than for the entire year 1916. For the past year and a half the plant has been in operation day and night, turning out 500 tires and tubes daily for seven branches in the principal cities of the Middle West. The factory is now 60 days behind orders, and because of limited facilities has not been in a position to take on new accounts for over a year.

The officers of the company are L. J. Elliott, president; C. H. Wright, secretary and treasurer.

WILL WHOLESALE ONLY.

The Berrodin Rubber Co., Philadelphia, Pennsylvania, which has been doing a wholesale and retail business in tires and accessories at 713-715 Broad street for the past year, has discontinued its retail department, and will hereafter confine its business exclusively to the wholesale end, catering to garages and supply stores.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE northward migration of negroes is becoming a problem in the Middle West. To Ohio, it is estimated, have come during the past year or two 100,000 of the 700,000 blacks who have been known to leave the South seeking advancement. Attracted by the good wages paid by rubber manufacturers, the negro population of Akron has doubled within a year and now numbers about 3,000. A newer and larger negro district with opportunities for thrifty blacks to buy homes on the instalment plan will go a long way toward making the best of the situation, and such a movement must, of course, be worked out by leading business men in conjunction with representative negroes long resident in the city. Given proper home influences and a fair opportunity to work, it is believed these newcomers will become frugal, industrious, law-abiding citizens.

Leading Ohio negroes, ministers, teachers, social workers and members of the State War Board, realize the duty confronting them, and on July 12 some 200 met in Columbus to discuss how to house the negro, how to avoid race troubles, how to make good citizens out of southern negroes, how to put it up to the better class of negroes to see that the newcomers are disciplined, and how to improve the moral conditions in negro districts. Rev. R. A. Jones, pastor of the Second Baptist Church and prominent in negro circles, was present from Akron.

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The regular annual convention of the service men of the Firestone Tire & Rubber Co., at Akron, is an institution of no inconsiderable business and social value to those connected with the large organization, coming from all over the country to meet together at the home office. This year, owing to conditions in national affairs, it was decided to abandon the elaborate plans that had been made for the service convention. But in order not to forego the benefits of this comprehensive review of the year's work and plans for the year to come, the novel plan was adopted of bringing the mountain to Mahomet, or specifically, the convention to the men, instead of the men to the convention.

Various members of the Akron organization who had planned to address the service men during the convention prepared their speeches in written form, one of these being a very interesting treatise by G. R. Lamson, in charge of the Firestone Library, on the value of "courtesy" and "good will" as business assets. These printed talks are being sent periodically to the men in the various cities where the company is represented by branches or agencies.

The stock for which Firestone employes have subscribed under the company's plan to allow its workers to become stockholders will be held by the firm should the employe enlist or be drafted into any branch of government service, payments being postponed.

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The Mason Tire & Rubber Co., at Kent, this state, is progressing with remarkable rapidity. Net earnings for the quarter to July 1 were at the rate of $300,000 per year. During the past two months the company has paid eighteen months' accumulated dividends due on the 7 per cent cumulative stock. The fore part of August the dividend due on preferred stock from January 1 to July 1 will be paid, and thereafter the preferred stock will be upon a quarterly dividend basis.

Four extensions to the plant are in progress, including a warehouse, mill room, main plant extension and office building. The present average production is 500 tires per day, and by the first of January it is planned to extend the capacity of the plant to 1,500 tires per day.

Four direct factory branches are maintained, at Akron, Cleveland, New York and Kansas City, and additional branches will be opened in the near future. The company is making a popular priced line of plain, ribbed, and non-skid tires and will have a cord tire on the market by the first of next year.

Recent important acquisitions to the office personnel are Dave Kennedy, formerly advertising manager of the Swinehart Tire & Rubber Co., and John H. Diehl, sales manager, formerly with the Portage Rubber Co. in the same capacity.

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The books of The B. F. Goodrich Co. were closed on July 1 for the purpose of determining the result of operations for the first six months of 1917. They have not been audited by public accountants, but the company's auditor has just submitted to the directors a statement of earnings for the period. After making full provision for maintenance charges, depreciation, doubtful accounts, and all known outstanding current liabilities and accruals, the net profits for the period amounted to approximately $5,200,000, exclusive of provision for excess profits tax not yet ascertainable.

The Goodrich school offers all employes an opportunity to learn English, free of charge, the classes being arranged so as to make it possible for workers on all shifts to participate. Upon the request of a number of employes, who have realized the growing importance of Spanish as a commercial language, classes for the study of Spanish have also been instituted under the direction of Dr. Junek.

W. A. Johnson, former assistant, has become office manager of the automobile tire department of The B. F. Goodrich Co., succeeding A. J. Wills, who has assumed special duties in association with H. C. Miller, director of tire sales. Mr. Johnson was at one time general sales and advertising manager of the Pierce Cycle Co., Buffalo, New York.

The Goodrich Girls' Country Club, now being completed at Rex Lake, nine miles south of Akron, is for Goodrich women employes exclusively. Tennis and croquet courts are now being laid out.

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The Goodyear Tire & Rubber Co., in connection with the city of Akron, held a mammoth celebration of Independence Day at the company's recreation park, known as Seiberling Field. There was a grand review of Akron boy scouts and scoutcraft exhibitions, a base ball game, and a concert, followed by a community song festival, the largest affair of the kind ever held in Akron and this part of the country.

A fire on June 16 in one of the concrete storehouses of the Goodyear company, believed to be due to spontaneous combustion among the many compounding ingredients kept in the structure, resulted in damages estimated at $40,000. None of the manufacturing departments was affected.

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The Amazon Rubber Co. has established a thoroughly equipped chemical research laboratory with H. G. Arbogast in charge. Mr. Arbogast was formerly assistant chemist in one of the large local rubber companies.

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J. W. Rock, vice-president of The American Rubber & Tire Co., Akron, Ohio, announces the marriage of his daughter, Hazel Kirk, to George A. Madole, who is connected with The B. F. Goodrich Co. in a technical capacity.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

SOME of the rubber factories in and around Boston are preparing to shut down a part of this month, but not on account of lack of business. All of them seem to have enough orders on hand to warrant running right along, were the weather better for good work, the employes less desirous of a let-up and a vacation period, and were there no repairs and installations necessary. The rubber shoe factories are pushing ahead on both rubber footwear and tennis goods, for orders keep coming for

the latter despite the fact that the summer is half gone. This state of affairs applies equally to the Boston Rubber Shoe Co. and the Converse Rubber Shoe Co., of Malden, The American Rubber Co., of Cambridge, the Apsley Rubber Co., of Hudson, and the Hood Rubber Co., of Watertown. The belting and packing factories are also busy, the Boston Woven Hose & Belting Co. rushing in practically all its departments, while the demand for jar rings is in millions. The Boston Belting Co. has been running double or triple time a portion of the last two months. The Apsley Rubber Co., Hudson, and the Franklin Rubber Co., of Malden, are making ponchos on government contracts. The Revere Rubber Co., of Chelsea, was never busier, and the same reports or similar ones come from the makers of coated fabrics and artificial leather for carriage and automobile tops and upholstery.

* * *

The Hood Rubber Co. plant, with its recent enlargements, mentioned in a former letter, is just buzzing with industry, and the output shows the remarkable progress of the company's business. The daily product of this big plant includes 40,000 pairs of rubber boots and shoes, 36,000 pairs of canvas footwear, 750 tires, 600 tubes and 80 solid rubber tires. Few companies in the industry can boast of greater progress than has been made by the Hood Rubber Co., which started in one small factory not so very many years ago.

* * *

J. H. WILLETT.

The Goodyear Tire & Rubber Co. salesrooms in this city are on Boylston street in the automobile district, where the company occupies a handsome business building including fine showrooms. But this is certainly an inconvenient place for footwear men to visit and the company has just opened a sample room for the sale of its "Neolin" soles in the heart of the shoe and leather district, at 283 Essex street. This office is in charge of J. H. Willett, who serves as special representative for these soles to the wholesale trade. Mr. Willett has a wide acquaintance in the footwear trade, having traveled over the entire country for prominent firms as well as with shoes made in his own factory. His retirement from the shoe manufacturing business a year or two ago was preliminary to forming this business connection with the Akron company for presenting to the shoe manufacturers of the country the advantages of this now well-known substitute for leather, used in bottoming shoes.

* * *

The Fisk Rubber Co., Chicopee Falls, this state, has one of the largest and most successful factory athletic organizations in the country. It is organized under the name of the Fisk Athletic Association, and is a registered member of the A. A. U. Some 2,500 employes, with paid-up memberships, are enrolled. The activities are all in the hands of the employes, governed by elected officers and committees, and a board of directors. It not only supports an all-star baseball team, known as the "Red Tops," but conducts a league of six teams, all Fisk workers, and these teams are playing excellent baseball, and affording recreation for the employes of all departments. As has been previously mentioned in these columns, the company has a fine athletic field, 20 acres in extent, where these games are played, and where other athletic sports are indulged in by the workers at the factory. The association has furnished uniforms, bats, balls, bases, etc., for these teams, between which much good-natured rivalry abounds. A recent success of this association was the staging of a first-class track meet, to which were attracted a number of the leading amateur and college stars of New England.

* * *

E. M. & F. Waldo, manufacturers and dealers in compounding ingredients and colors, New York City, have opened an office in the new Rice Building, 10 High street, Boston, in order to take better care of their increased business in this territory. This office is in charge of Townsend H. Cushman, who has been with the house for several years and is well known to the New England trade.

* * *

The Pneumatic Cushion Inner Tube Co., of this city, which is exploiting a rubber cushion filler to take the place of an air-filled inner tube, has made arrangements to have its product manufactured at Canton, this state. It is rumored that there is a possibility that the government will adopt this non-collapsible tube for army vehicles.

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Ellis F. Harlow, son of President Robert C. Harlow, of the Monatiquot Rubber Works Co., South Braintree, has enlisted in the First Massachusetts Engineers, which regiment will be called on July 25. This regiment was formerly known as the First Corps Cadets, whose history dates back to 1776.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

APPLICATIONS that are interesting to the rubber industry have been made to the Warren Town Council for exemption from taxation on proposed new buildings and land of three corporations which are contemplating locating in Warren. The petitions were received at a meeting of the Town Council early in the last month and after an informal consideration were continued for action at some future meeting.

The corporations seeking exemption from taxation for ten years are the American Web Co., which is to manufacture narrow fabrics, and is located at Boston; the Deaudelion Fabric Co., to manufacture tire fabric, and the Lynn Manufacturing Co., of Lynn, Massachusetts, manufacturing rubber heels, soles and arch supporters. The town clerk was authorized to correspond with these concerns, notifying them to send representatives to confer with the members of the council.

* * *

A chicken dinner and an extended program of athletic contests featured the annual outing of employes of the Davol Rubber Co., Providence, July 14, at Duby's Grove. With respites for dinner and luncheon, the sports continued from the arrival of the party in special electric cars shortly after 9 o'clock until 4 o'clock, after which dancing became the form of entertainment. Prizes in the sport events were awarded.

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The National India Rubber Co., Bristol, has had a considerably higher valuation placed upon its property in that town by the tax assessors this year than that in 1916, following the construction of numerous additional buildings, the improving of the old structures and the introduction of new machinery and equipment. The valuation now is $790,000. Last year it was $555,000. The company will pay a tax this year of upwards of $13,000.

One of the most attractive features in the Fourth of July parade at Bristol was the appearance of 60 young women employed in the stitching room of the National India Rubber Co., who paraded as Red Cross nurses.

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The Bourn Rubber Co., Providence, is calling for experienced shoemakers, also young women to learn.

A contract has been given for the erection of a building for

office and shipping room at the Anchor Webbing Co.'s plant, Pawtucket. The new building will be brick, mill construction, 53 by 60 feet, two stories, to cost $12,000.

An extensive system of fire escapes has recently been placed on the buildings at the plant of the Atlantic Tubing Co. at Knightsville.

Hill & LaCrosse, manufacturers of elastic webbings, have been building an extension to their plant at Howard.

The Revere Rubber Co., Providence, is calling for girls over 16 years of age, for warping and table work, in its rubber thread department. The concern is very busy and is furnishing employment for a large number of new hands in the various departments.

The Bay Spring plant of the International Rubber Co., at West Barrington, has been working on night and day shifts the past month to fill orders for a carload of rubber goods a day. It is expected that this schedule will be continued indefinitely.

THE RUBBER TRADE IN TRENTON.

THE Home Rubber Co., manufacturing mechanical rubber goods, has acquired a 50 by 100 foot site, adjoining its plant for the erection of an addition.

* * *

Sensible one-piece bloomers and blouses of durable, medium-weight blue fabric are being adopted by the girls employed by the Semple Rubber Co., maker of inner tubes. The wider employment of women in rubber and other manufacture everywhere

seems inevitably to be leading to this dress reform which appears to have come to stay. It provides a comfortable working uniform permitting full freedom of action and saving the street clothing.

* * *

The Dural Rubber Corp., recently incorporated with a capital stock of $200,000, has acquired a five-acre site with buildings at Flemington, New Jersey. The main structure, 40 by 200 feet, is a model of its kind, embodying the day-light feature and served by a spur track from three railroads. The new works will be devoted to the manufacture of aircraft rubber equipment, automobile tires, tubes, sundries and molded rubber goods, which will be sold under the registered name of Dural.

The officers of the company are Edgar H. Wilson, president and general manager; W. C. Ehrenfeld, vice-president; Caleb S. Green, treasurer; G. F. Ginglen, secretary. The directors include Newton A. K. Bugbee, comptroller of the State of New Jersey; J. E. Gill, J. G. Conner and J. R. Hall.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicated with him.

[310.] Names of manufacturers of a machine for making rubber balls or bulbs are requested.

[311.] A correspondent wishes to know where he may obtain rubber poker chips.

[312.] Names of manufacturers of serial numbering machines for stamping numbers on thin metal strips, are sought.

[313.] An inquiry has been received for names of manufacturers of machinery used in making adhesive tapes.

[314.] Names are desired of makers of machines used for applying starch, bone black and other powders to sheet rubber.

[315.] We have an inquiry for gasoline cans used by tire makers.

[316.] Tire building machines are sought.

[317.] A correspondent desires to be furnished with a list of manufacturers of aldehyde ammonia crystals.

[318.] A correspondent wishes to know where the various parts for fountain pens may be obtained.

[319.] A correspondent is in the market for a fabric inspection machine.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A complete collection of samples of various prices, discounts, etc., of imitation leather is desired by a firm in the British West Indies. Report No. 24,742.

An agency is desired by a company in Italy for the sale of vulcanized fiber and ebonite. Report No. 24,770.

A firm in Italy wishes to purchase imitation leather. Report No. 24,775.

A company in Sweden desires to be placed in communication with American manufacturers and exporters of rubber, automobile tires, etc. Report No. 24,778.

An agency is desired by an applicant in Italy for the sale of artificial leather. Report No. 24,780.

A man in France wishes to represent American manufacturers and exporters of artificial leather and leather substitutes used for automobile tops, etc. Report No. 24,785.

Catalogs and price lists are desired by a man in Spain for rubber hose. Report No. 24,843.

An import agent in Russia desires to be placed in communication with American manufacturers or exporters of pneumatic tires. Report No. 24,845.

Communication is sought by a business firm in Russia with American dealers in raw rubber. Report No. 24,864.

Quotations are desired by a firm in East Africa for lead pencils, with and without erasers. Report No. 24,867.

A dealer in haberdashery goods in East Africa wishes to purchase cheap grades of men's garters. Report No. 24,901.

A manufacturer's agent and importer in New Zealand wishes to be placed in touch with manufacturers of all sizes of suit cases, in canvas, fiber and imitation leather. Report No. 24,962.

A company in the Dutch East Indies desires to purchase rubber and linen collars and cuffs for army officers. Report No. 25,004.

OLD RUBBER AND RUBBER HOSE ARE AMONG THE MATERIALS condemned as unfit for use and listed to be sold at the Navy Yard, Puget Sound, Washington. The sale will be for cash to the highest bidder by sealed proposals to be opened at 1 p. m., August 17, 1917. Schedules containing form of proposals can be obtained upon application to the Supply Officer, Navy Yard, Puget Sound, Washington.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

WITH regard to business conditions generally there is no change of note to record in the situation, which may be summed up in the statement—great activity where government contracts are concerned and slackness amounting in cases to depression in general home and export business. The bogey of dearer rubber has been scotched by large arrivals and there is now no rush to provide for anticipated needs. The topic of the moment is the price of cotton rather than rubber, and there seems little doubt that a more or less prolonged era of short time or knocking off of a certain number of looms, which amounts to the same thing, is in store for Lancashire.

A sensation of the first half of June was the rapid appreciation in the market value of the Parent Tyre Co., Limited, (Dunlop) on account of the anticipated combination among tire manufacturers which at the time of writing has not yet matured, or, at any rate, been announced.

With regard to the market premium on Brazilian Para rubber this is really to-day a greater compliment than it was five or six years ago when the premium was the same, and this because it is generally noted in the trade that the loss in washing is higher than it was, *viz.*, 18 or 19 per cent more against the old figures of 15 or 16 per cent. This is put down to the greater rapidity in getting the rubber in the market and the consequent decreased loss of moisture by evaporation.

RUBBER-FACED CARD CLOTHING.

A branch of the rubber industry which has been hit by the war is that of rubber-faced card clothing for use in textile mills. Not only is the export trade disorganized but the regulations with regard to the sale and purchase of the steel rods from which the wire joints are made are such as cause difficulties and embarrassment in the manufacture. This business is carried on in various factories in Lancashire and Yorkshire, specially devoted to it and not in what may be termed rubber works proper. Some of the card clothing is made with vulcanized rubber and some with pure rubber and the old rubber from the latter, always of the best quality, is constantly in demand by reclaimers.

RUBBER RECLAIMING.

This leads me to refer to the fact that a new reclaiming works has been started at Fielding Mills, Middletown, near Manchester, by Stead-Hunt, Limited, which, if my memory serves me rightly, was a name associated with the artichoke synthetic rubber business which commenced its short-lived career at Handforth four years ago. The new reclaimed rubber is called Russam and is said to be made by an entirely new and original process with the use of acid or alkali. Of course, a good deal of rubber has been reclaimed in the past, and is no doubt at present, without the use of acid or alkali, but it will be for the astute rubber manufacturers to determine whether reclaimed made without acid or alkali is superior to that made with these auxiliaries, and the matter can safely be left to their judgment. It has surprised many readers on this side to see in a recent number of THE INDIA RUBBER WORLD a reference to a legal decision regarding the alkali patents. Presumably the explanation is that patents have a longer life in America than they have here, any extension of a patent over its 14 years' span being very rare with us. With the expiry of the Mark's "alkali" patent in England four years ago there is now no question of any litigation among the three or four concerns working the alkali process in England.

Delivery of rubber machinery to orders which are readily quoted for and taken is still a matter of great delay and uncertainty and is the main reason for the slight progress made with regard to projected developments.

A BIRTHDAY HONOR.

Sir Frederick H. Smith, Bart., has been created a baron of the United Kingdom and has taken the title of Lord Colwyn, from the resort on the North Wales coast, where he has a residence. Although a commercial magnate of varied activities and business associations, he is, of course, best known to the rubber trade as chairman of the Charles Macintosh Co., Limited, and some of their subsidiary undertakings. Better known in Lancashire than in London, it was not altogether surprising that on one occasion a few months ago, when his name became prominent in connection with the report of a tariff committee, some of the London papers confused him with Sir Frederick Smith, the Attorney-General. The latter, who is a Unionist, does not see eye to eye with the new peer, who belongs to the opposite camp. So, no wonder certain leading writers were bewildered at what seemed a very rapid change of opinion even in these days of chameleon procedure.

DISASTROUS FIRE.

On June 13 a fire, followed by an explosion, occurred at the works of the Hooley Hill Rubber & Chemical Co., about seven miles from Manchester, with the result that the works were entirely destroyed, the managing director, H. S. Dreyfus, being among the 41 persons killed. The death roll was added to by persons in the vicinity of the works at the time of the explosion, a great many of those employed in the works having managed to get into safety when the alarm of fire was given. Mr. Dreyfus, no doubt, could have saved his own life had he not remained to see that others had warning and assisted in the attempt to subdue the fire. It was at this works that the experiments with accelerine (para nitroso dimethyl aniline) were carried out and a part of the business of the works recently has been the manufacture of this accelerator for sale to rubber works.

DUNLOP INCREASES ITS STOCK.

At a meeting of the shareholders of the Dunlop Rubber Co., Limited, London, on June 22, the capital stock was increased to £6,000,000 by the creation of 3,000,000 new 7 per cent preference "C" shares of £1 each, 10 shillings per share to be called up at once and the balance not for a year at least. The borrowing powers of the board of directors were also increased from £300,000 to £3,000,000.

So rapidly has the business of this company been growing, particularly in the new mill completed May 1 for the manufacture of solid tires for army transport, that last November £1,000,000 in 6½ per cent cumulative "B" preference shares were created in order to double the stock of raw materials as a war-time safeguard and to finance the manufacture and sale of solid tires. Raw stocks were, however, increased to over £2,250,000, an excess of £720,000 over and above the £750,000 intended for that purpose. This must be deducted for the fresh capital, and the balance, roughly £500,000 after the payment of expenses, will be used to finance greatly increasing normal business.

In his address moving these increases, Acting Secretary A. Cunningham referred enthusiastically to the cotton mills and rubber estates of the company, both of which investments had been made at a particularly fortunate time and had proved an unqualified success. The profits and savings of the mills had equaled their initial cost and equipment, and the profits of the estates, embracing 27,000 planted acres, were now approaching the profits made a few years ago by the Parent Tyre Co.,

Limited, and the Dunlop Rubber Co., Limited, itself. He also declared the rumor of the absorption of the shares of the Parent Tyre Co., Limited, or any amalgamation of that company with other British or American firms was unfounded. Negotiations had been in progress, but had been terminated and withdrawn.

SOCIETY OF CHEMICAL INDUSTRY.

This society has issued the first of its annual report on the progress of applied chemistry, Dr. Henry P. Stevens being the compiler of the section relating to india rubber. The reports form a useful and handy summary of recent progress in various trades and manufactures and are largely concerned with the work of the research chemist. The india rubber manufacturer, we all know, is not particularly communicative, so it is not surprising that the pages compiled by Dr. Stevens deal more with what may be described as pure chemistry than with actual works practice, abstracts of most of them having already come before those interested by way of the trade journals.

The society holds its annual meeting, now known as a chemical congress, at Birmingham this summer, and it is interesting to note that two papers by rubber works chemists are listed. One is on "The Chemistry of Vulcanization," by Dr. D. F. Twiss, of the Dunlop Rubber Co., Limited, and the other by B. D. Porritt, of the North British Rubber Co., Limited, on "The Scientific Needs of the Rubber Industry."

Among the works to be visited by parties of members is the Dunlop rubber factory, and it is requested that no one connected with the rubber industry will apply for a ticket. It is also stated that only members who are British born will be admitted at the present time to the majority of the works to which visits have been arranged.

THE INEQUITY OF THE EXCESS PROFITS DUTY.

Now raised from 60 to 80 per cent, the British excess profits duty in its relation to rubber producing companies is the cause of constant discussion and correspondence, leading, it is asserted, to glaring instances of inequity and absurdity in the manner of its application. In a letter recently addressed to all members of the House of Commons, suggesting an amendment to the Finance Bill before Parliament, in order to mitigate the handicap suffered by the younger companies, Messrs. Gow, Wilson & Stanton, London, showed the injustice of the so-called Vallambrosa judgment, in pursuance of which all expenditure of a recurring nature on maintenance during the immature stage of a rubber plantation, is deducted from the profits in order to compute the income for income tax, irrespective of whether the source of the funds for this expenditure is capital or not. This judgment, it was explained, affects illogically the progressive old producer and the young producer. For instance:

The old progressive producer planted up to 1906, 750 acres; in 1908-09, 700 acres; in 1910-11, 700 acres, making a total of 2,150 acres. The high profits derived from the old areas during 1911, 1912 and 1913 would be reduced to a fictitiously low level by subtraction of the cost of maintaining the still immature areas. But the profits from the 1908-9 and 1910 plantings coming into bearing after the war, would not be similarly reduced. Consequently the taxable incomes would work out as follows:

Year.	Actual profit.	Expenditure on immature area.	Statutory income.
Pre-war 1912.....	£30,000	£10,000	£20,000
Pre-war 1913.....	32,000	7,000	25,000
Post-war 1914.....	37,000	2,000	35,000
Post-war 1915.....	55,000	nil	55,000

On the other hand, the young companies formed in the years 1909 and 1910 with very small areas, subsequently received funds for the purpose of opening up large areas during 1911, 1912, 1913 and 1914. The small early plantings would naturally yield but little profit, whereas the later areas, coming into bearing after 1913, would throw off proportionately more and comparison of pre-war and post-war gains would show an excess profit which in fact did not exist.

CEYLON SHIPMENTS CURTAILED.

The British Shipping Ministry has ordered that Ceylon place rubber last in her exports to Great Britain, which means shutting it out altogether. This does not affect shipments to America and Australia. Strictly limited freights prevent large quantities from going to the latter country. It is, however, hoped that America will increase her imports, for while up to May 7 England obtained over 12,000,000 pounds of rubber against less than 7,000,000 last year, the United States bought under 6,500,000 pounds against 10,000,000 to date in 1916.

Meanwhile, Great Britain has given preference to the Federated Malay States, which have only rubber and tin, with cocoanuts a bad third, whereas Ceylon has several strings to its bow, notably tea and copra.

LABOR TROUBLES IN RUSSIA

MANUFACTURERS of rubber goods in Russia are having their full share of difficulties incident to the present social and political upheaval, according to the correspondent of the "London Daily Telegraph," who is quoted by "The Indian Rubber Journal."

It seems that one morning a delegation of 50 to 60 men, representing the 20,000 hands at the Petrograd works of the Treugolnik Rubber Co., went to the directors asking for a raise of 15 copecks an hour in wages since the beginning of the war and also settlement of a claim rejected by the courts several years ago. The total was 11,000,000 rubles, and they had all brought linen bags expecting immediate payment.

The directors, who had always prided themselves on the cordiality of their relations with their men, argued the case patiently but unavailingly, pointing out that the usual war bonus had been paid, that privileges not enjoyed in other factories had been extended, and explaining the impossibility of meeting such demands. Reference to the Central Board of Conciliation was suggested, but the men only threatened to throw the directors into a nearby malodorous canal. It was then decided to request the Minister of Industry and Commerce to take over the management of the company, and the Minister of Justice and the Council of Workmen's and Soldiers' Delegates were notified to that effect.

The men thereupon raised their demands to 12,000,000 rubles, placed the five directors present under arrest and took them to the Ministry of Justice where they were detained until evening. Meanwhile, an influential member of the Council of Delegates, Gvosdeff, with much difficulty, induced the men to place their claims before the Central Board of Conciliation.

FOREIGN TRADE REPORTS.

AUSTRALIA.

IMPORTS from the United States show a marked increase. For the fiscal year ended June 30, 1916, the value of manufactures of rubber was $2,380,993. For the first quarters of 1916 and 1917 the values were $61,245 and $60,710, respectively.

During the fiscal years 1915 and 1916, the United States exported to New South Wales:

	1915.	1916.
Tires	$214,189	$1,618,703
Treads, etc.	6,940	7,946
Rubber boots and shoes	107,151	49,662
Gum and wading boots	10,195	19,892
Totals	$338,475	$1,696,203

The large increase in the sale of American cars and tires resulted from a personally conducted campaign, with Australian

supply depots managed by experienced Americans, and with extensive advertising in local newspapers and magazines; another factor was the difficulty of importing from Europe. According to "The Australian Motorist," the demand is for low-priced cars and the American manufacturers are getting the business. It is stated that there is not an American car in the Commonwealth costing more than $2,554.

CEYLON.

Exports of rubber to the United States during the first quarter of 1917 were 6,968,047 pounds, valued at $4,204,506.

SIAM.

[Vice Consul Carl C. Hansen, Bangkok.]

During the fiscal year ended March 31, 1916, 37 motor-cycles were landed at the port of Bangkok, against 25 for the previous year, and their declared value was $7,730 and $4,639, respectively. The imports of bicycles advanced from 1,196 machines, valued at $19,872, in 1915 to 1,281 machines, valued at $24,598, in 1916.

The value of the rubber-tire imports for motor-cycles and bicycles was $9,590 for 1915 and $14,551 for 1916. All of this trade is chiefly British.

The import duty on all kinds of cycles and parts, including rubber tires, is 3 per cent ad valorem.

SPAIN.

The accompanying figures show the imports of rubber and its manufactures for the years 1915 and 1916:

	1915.		1916.	
	Metric Tons.	Value.	Metric Tons.	Value.
India rubber, gutta percha and substitutes:				
Unmanufactured	948	$1,109,531	1,697	$1,986,278
Tires	280	981,305	578	2,030,837
Other manufactures of	389	866,305	484	889,507
Totals	1,617	$2,957,141	2,759	$4,906,622

The chief countries of origin of tire imports during 1915 were:

United States.	France.	Great Britain.
$21,337	$407,865	$172,551

SWEDEN.

Owing to the scarcity of rubber, Goteborg factories dependent upon rubber for raw material have been closed and practically all automobiles and taxicabs in the city and district have been put out of commission. The exportation from Sweden of parts of flying machines and airships, and also of air balloons and parts has been prohibited.

EXHIBITION OF TOYS, GAMES, SPORTING AND GYMNASTIC GOODS IN VENICE.

The organizing committee of the National Industrial Exhibition of toys, games, sporting outfits, and gymnastic apparatus, which is to be held in Venice next September, announces that although the exhibition is intended for Italian manufacturers, it is desired to display a few good productions of a similar nature manufactured by the Allied nations, in order that Italian manufacturers and the general public may have an opportunity of seeing what friendly nations have accomplished in these industries which before the war were extensively carried on in Germany.

RUBBER GOODS IN GREECE.

Conditions brought about by the war are continually causing new markets to be opened for various products. Thus, whereas Austria and Germany formerly supplied Greece with three-fourths of the rubber goods needed there, they are now off the market, and the United States ought to be able to furnish them. American firms contemplating the establishment of business relations with Greece should remember the importance of having a commission agent there fully trusted and familiar with all local needs and customs, and above all, familiar with the language.

THE SITUATION IN THE DUTCH EAST INDIES.

By a Special Correspondent.

THE shipping difficulties are causing the accumulation of large quantities of various products, including rubber. Naturally this condition is regarded with a certain amount of anxiety and the question has been raised whether it was advisable to build large warehouses for storing these goods. In view of the possibility of further shipping hindrances and of deterioration in the quality of the goods, due to climatic influence, the suggestion has gone forth to establish markets in America whence the products could be further distributed. This is urged as a more feasible plan, especially as even before the war large quantities were consigned to New York instead of to Holland.

RUBBER FACTORY IN BATAVIA.

Industries here are making great headway and the government is fortunately far-sighted enough to see the importance of supporting them. It has, therefore, liberally subsidized several companies carrying on operations in Java.

A rubber factory, running along the same lines as the one at Singapore, has been opened in the east end of Batavia. It covers an area of 1,500 square meters and has been equipped with the most up-to-date machinery. Rubber goods of many kinds previously supplied by Germany will be produced and orders have already been booked for a long time in advance.

CENTENARY OF THE BUITENZORG BOTANICAL GARDEN.

On May 18, 1817, a botanical garden was founded at Buitenzorg, which has not only developed into one of the greatest botanical institutions in the tropical world, but has become a center for the scientific study of the tropics in general.

After half a century of more or less retarded progress the garden suddenly began a more rapid development. It became a power in the economic position of the Dutch colonies in the East; new crops were introduced and seeds of those already known were more widely distributed. Expeditions were undertaken to discover what products of economic importance flourished in a wild state in these islands—several journeys having been made in search of lactiferous plants, for instance—and plants thus found were often cultivated.

Besides this, laboratories were erected, diseases studied and selections made. Soon, also, experiment stations were organized, demonstration fields were laid out for the benefit of the small landowner and agricultural instruction was given through investigations in the laboratory concerning the crops, especially those cultivated by the natives. When the questions with which the institution occupied itself encroached more and more on purely economic ground, the Department of Agriculture was founded, to which was added at a later period a section for Industries and Commerce.

It had been planned to celebrate the centenary of this unique establishment with due solemnity, but present conditions have made it necessary to postpone festivities until after the war.

GOVERNMENT RUBBER PLANTATION TO BE SOLD.

In connection with the government's decision to offer the state rubber plantation at Langsar, Sumatra, at public sale, it has been proposed to announce the sale at so early a date and to make such arrangements for inspecting the estate as to enable prospective buyers in Europe and America to communicate with their representatives here. Considering the present difficulties of communication, it cannot be said that the government has chosen a very favorable time for the sale.

RUBBER CULTIVATION IN TAPANOELI, SUMATRA.

Until quite recently the residency, Tapanoeli, on the west coast of northern Sumatra, did not boast a single European planting enterprise. Now, however, there are several flourishing plantations, new ones are being constantly opened up and the whole

residency is practically overrun by surveyors and prospectors.

Rubber is the chief product, and of the three principal companies, the Sumatra Caoutchouc Plantage Maatschappij is the most important, having five estates of which the largest, Batang Toroe, is the finest in all Tapanoeli. The factory is worked by steam. There is an up-to-date central hospital with separate wards for infectious diseases and directed by a European doctor. Both here and on another of the company's estates are comfortable clubs much frequented by neighboring planters.

The Rotterdam Tapanoeli Cultuur Maatschappij began with a capital of 2,000,000 gilders [$800,000]. In 1915, the production of rubber from this estate was 313,027 pounds. Here, too, there is a club, a good hospital and a motion picture theater. The factory is run by electricity and, like all other buildings and houses on the estate, is electrically lighted.

Almost all companies employ contract coolies from Java, and medical aid, hospitals and proper sanitation are amply provided. The various planters have formed an association which works for the general good of the district.

The center of all this is the little town of Batang Toroe, whence the rubber and other products of the neighborhood are forwarded by automobile trucks to the seaport, Sibolga, for export. There is also a government automobile service running between the port and Padang Sidempoean, which touches Batang Toroe, and there are very definite plans for connecting the latter place with Sibolga by rail. All indications point towards the future importance of Batang Toroe and to the significance of Tapanoeli as a rubber-producing country.

NATIVE PLANTATIONS.

Urged by the government to develop the cultivation of rubber, the natives of Djambi and Palembang, Sumatra, began planting rubber trees with more zeal than knowledge. Consequently, the native holdings are generally miserable sights. Trees having a girth of barely 15 cm. at a height of one meter are tapped with appalling frequency. At present native rubber sells from 15 to 20 per cent below European rubber and there is reason to expect that unless something is done in time, this difference will increase. It appears that steps are being taken to remedy the condition by appointing European inspectors and instructors, but it is feared that by the time such corrective measures will have actually been put in practice it will be too late. Meanwhile, about 4,000,000 trees have been planted by natives in Palembang, and according to authorities, 50 per cent may, with proper care, reach the bearing stage and for years to come will yield about two pounds of rubber per tree.

RUBBER IN EAST JAVA.

The cultivation of *Hevea* is progressing steadily and trees are rapidly coming into bearing condition. The following figures obtained from one estate illustrate this: The area of the estate is 25,000 acres; at the beginning of 1915, a yield of 1,557,317 pounds of rubber was obtained from 435,039 trees and at the end of 1916, the production from 964,045 trees was 3,375,147 pounds. For both years the average per tree was about 3½ pounds.

According to reports from Wlingi, abnormally heavy rainfalls are interfering with tapping and much anxiety is felt concerning the rubber yield.

RUBBER COMPANIES.

The fusion of five rubber companies is announced, namely, the Bajan Sumatra Rubber Co., the Langsar Sumatra Rubber Co., the Plantation Co. Dolok Marangir, the Rotterdam Langkat Rubber Co., and the Rotterdam Deli Hevea, Limited. The new company thus formed is known as the N. V. Vereenigde Indische Cultuur Ondernemingen, and has a capital of 10,000,000 florins [$4,000,000].

The Lampong Sumatra Rubber Co., lately founded and having a capital of 900,000 florins [$360,000], has taken possession of all the property of the N. V. Lampong Caoutchouc Co.

The issued capital of the Bandar Sumatra Rubber Co. has been increased by 500,000 florins [$200,000], so that at present it amounts to 1,100,000 florins [$640,000]. The authorized capital, 2,500,000 florins, [$1,000,000], remains unchanged.

The Amsterdam Java Rubber Co. has reduced its authorized capital to 300,000 florins [$120,000], while 300,000 florins new capital has been issued.

A NEW DUTCH TRANS-PACIFIC STEAMSHIP LINE.

Two large Dutch steamship companies, the Netherlands Royal Mail Line and the Rotterdam Lloyd, have combined to run a semi-monthly passenger and cargo service from Batavia to San Francisco with Singapore, Hong Kong, Nagasaki, Yokohama and Honolulu as ports of call. The vessels to be employed, which number eight, are large ocean-going steamers, most of which have hitherto been running between Batavia and Rotterdam, *via* Suez, and they will make the trip from Yokohama to San Francisco in about 17 days.

TAPPING ON ONE OF THE SUMATRA PLANTATIONS OF THE GENERAL RUBBER CO.

It appears that for some time at least there is little likelihood of cargo being accepted from Japan, as all available space will have been booked in Java and Singapore. The rate from Japan to Java will be 22 yen* per ton. Cargo from Yokohama has hitherto been transhipped at Kobé, and thus costs 3 yen more (or 25 yen in all) per ton than cargo from Kobé. The rate by the Japanese subsidized lines is about 14 yen per ton.

DUTCH PLANTATION COMPANIES INCREASE CAPITAL.

Two companies in Dutch East Indies have recently increased their capital. The Javasche Cultuur Maatschappij to 5,000,000 florins; the Nederlandsche Gutta Percha Maatschappij is offering its shareholders the opportunity of subscribing for additional shares to the amount of 300,000 florins, and the Amsterdam-Tapanoeli Rubber Cultuur has under consideration the doubling of its capital to 2,000,000 florins.

PRODUCTION OF GUTTA HANGKANG.

The latest statistics for Gutta Hangkang show that the production for the year 1916 amounted to 2,296 tons, as against 2,466 tons in 1915 and 1,905 tons in 1914.

This product is obtained exclusively in Borneo and is exported chiefly to Singapore where the bulk is purchased by America.

JAPANESE, CHINESE AND GERMAN BANKS.

The "Indische Mercuur" questions whether those banks which have continually increased their capital will be able to invest large sums profitably after the war. The fact that Japanese merchants are settling more and more, and that the position of the Japanese and Chinese banks will consequently be strengthened,

*Yen = 2*s.* 0½*d.*

is regarded with some apprehension. Moreover, there is a large German population that desires to have its own bank, and rumors are already heard that the Deutsch-Ost-Asiatische bank intends to establish one or more branches.

THE 1916 RUBBER PRODUCTION IN THE DUTCH EAST INDIES.

It appears from the statistics compiled by "Netherland-India News" that the direct exports of plantation rubber from the Netherland-Indies amounted to 15,121 tons during the first half of the year 1916, as follows:

Java	*tons*	5,498
Re-shipments		622
		6,120
Outside districts		9,001
Total		15,121

The 622 tons from other localities, which were sent to Java for re-shipment to foreign countries, were primarily destined for the Batavia market, and originated for the larger part from Tapanoeli (221 tons), Lampongs (194) and West Borneo (76).

The total product of the Netherlands-Indies for the year 1915 was only 20,100 tons.

THE SITUATION IN MALAYA.

By a Special Correspondent.

MALAYAN COMMERCE.

VIEWED as a whole, business during 1916 was distinctly satisfactory. Money is plentiful and no failures of importance have been recorded. Figures show an all-round increase, though in the case of imports, the actual volume of trade was less than in pre-war times. Importations from Japan, however, have been growing rapidly, while the fact that the export trade—chiefly rubber and tin—with America *via* the Pacific Ocean, is undergoing an equal degree of development, is admirably illustrated by the following figures:

Tons.

1913.	1914.	1915.	1916.
2,800	3,800	13,000	15,200

Shipping difficulties are causing a great deal of anxiety, and it is feared that if conditions continue getting worse, the trade record for 1917 will fall greatly below that for the past year. At Penang, the arrivals and gross tonnage for 1915 and 1916 were:

	Ships Entered at Port.	Gross Tonnage.
1915	2,284	2,813,061
1916	2,209	2,577,020
Decrease	75	236,041

In spite of this condition, shipments of rubber were larger than ever. Singapore noted an increase of 60 per cent over the previous year, while from Penang exports of rubber for 1916 were 17,850 tons as compared with 14,738 tons during 1915—a difference of 3,112 tons. Prices for rubber were considered satisfactory. In the Federated Malay States, 2*s.* 1½*d.* was the lowest price obtained for Smoked sheet; at Penang, First latex brought prices ranging from 3*s.* 8½*d.* to 2*s.* 2½*d.* per pound.

The motor trade, which experienced a setback during 1914 and 1915, is recovering rapidly, due to the prosperity of planters and miners, who can take advantage of the fine roads through magnificent tropical scenery. The wealthier Chinese, however, are the best customers, since they are rarely satisfied with one car when once they take to motoring. It also seems likely that there will be a big demand for motor tractors in the near future.

The following figures show that the larger part of the supply comes from the United States, although in 1914 the United Kingdom leads:

	1913. £ Sterling.	1914. £ Sterling.	1915. £ Sterling.
United States	149,503	65,884	52,073
United Kingdom	133,709	88,429	29,521
Belgium	5,086	834	...
Germany	4,831	1,852	...
France	1,644	858	1,338
Italy	1,283	1,864	1,050

The total imports of cycles, automobiles and accessories at Straits Settlements ports were as follows:

	£ Sterling.
1913	323,824
1914	169,301
1915	93,622
1916 (nine months)	260,983

For the Federated Malay States the values were £129,816 and £44,060 in 1914 and 1915, respectively.

BANGKOK TO SINGAPORE BY RAIL.

Thanks to the energies of the general manager of the F. M. S. Railways, the Bangkok-Penang line has been completed, and it is now possible to travel from Bangkok, Penang and Kuala Lumpur to Singapore by rail. The construction of this new

SPECIAL TRAIN PASSING THE MARBLE HILL NEAR IPOH, PERAK, FEDERATED MALAY STATES.

line will undoubtedly play a great part in the development of the rich kingdom of Siam, and the Malay Peninsula may confidently look forward to a share of the benefits flowing therefrom. Penang, as the only deep-water outlet on the west coast of the peninsula, from Burma down, is certain to gain in importance.

INDIAN LABOR.

In a previous letter, mention was made of the existing difficulties in connection with the labor question. It can, therefore, be imagined that the news that the Madras Government had ruled that from April 1, 1917, immigration to the Federated Malay States would be limited to the lowest possible minimum, was received with anything but pleasure. It is hoped, however, that some arrangement will be made whereby the difficulties, thus augmented, may be diminished.

THE MALAY HOLDING.

Attention has lately been called to the hidden danger in the Malay holding. Malays are incorrigible fatalists; therefore, if their estates are attacked by some kind of pest or disease, and the most primitive methods fail to produce improvement, they calmly allow the destruction to go on, resignedly declaring it to be the will of God. Consequently it is feared that if things are allowed to continue in this way, pests and diseases which, strangely enough, do not do so much damage to small plantations as to larger ones, will spread from these small Malay estates to the European holdings in the form of practically unconquerable epidemics. Proposals have gone forth to put the matter before the government and urge that a staff of efficient inspectors be organzied whose duty it will be to inspect the Malay estates at certain intervals and deal drastically with any cases of disease or pest they may find.

A fire occurred on Malacca Rubber Plantations, **Serkam**

Estate, on March 29, early in the morning, causing considerable damage to the dry rubber factory. Fortunately there was no wind blowing and the offices and store close by escaped.

SINGAPORE EXPORT DUTIES HAMPER JAPANESE RUBBER INDUSTRY.

According to the "Far Eastern Review," the export duties on Straits rubber shipped through Singapore are likely to prove a heavy blow to Japanese manufacturers. Many factories have already suspended work temporarily because of the situation. Japan's rubber goods industries have been expanding rapidly of late and last year's imports of crude rubber up to November 30 at Yokohama amounted to 2,879,000 yen, as compared to 1,232,000 yen in 1913, rubber to the value of 2,109,000 yen, or 73 per cent coming from Singapore. Of the nation's demand, 9,000,000 yen worth is supplied by domestic goods, while imported articles amount to only about 800,000 yen.

BRAZILIAN NOTES.

MAY 13 was the anniversary of the day upon which the bill for the emancipation of slaves became law. From various parts of the country came reports of more or less brilliant festivities in honor of the occasion.

THE STEVEDORES' STRIKE.

For several days shipping activities at Para were interfered with owing to a strike of the stevedores. Of the many vessels held up at the port, were some waiting to be freighted with rubber for New York and Liverpool. Fortunately this state of affairs was soon brought to an end, thanks to the efforts of the governor, Dr. Lauro Sodré, who worked hard to bring about an understanding between the strikers and the shipping companies. The Lloyd Brasiliero, the Booth S. S. Co. and the Empresa Port of Para were among the companies affected.

A feature of the strike was that the conductors, motormen and chauffeurs threw up their work in sympathy with the stevedores.

RUBBER TRADE CONDITIONS.

Trade during 1916 was very profitable in the states of Amazonas and Maranhao, in the former owing to the high prices ruling in the rubber market. The fall in Brazilian exchange also benefited the exporting centers, Manaos and Maranhao. In spite of this, representative men are of opinion that the prosperity here is purely artificial and that the future is very uncertain. The British vice-consul at Manaos goes so far as to advise British export firms to refrain from extending large or lengthy credits. This is not without significance seeing that the greater part of the exports has up to now been financed by means of letters of credit issued by London bankers and merchants, although considerable amounts have been drawn for on New York in United States currency.

The fact that the output of rubber and caucho ball has remained stationary for some years while the Eastern production has not only increased by leaps and bounds, but has attained a perfection of quality comparable if not surpassing the best Brazilian rubber, is causing uneasiness even among the most optimistic. More scientific methods and the encouragement of planters and *seringueiros* are constantly urged.

The imports of rubber goods, including tires, show an enormous increase in favor of the United States, being 784 per cent in quantity and 554 per cent in f. o. b. value. The increase in quantity, 468,526 kilos, compared with the falling off of 456,720 kilos from Germany, shows that America has successfully replaced the former country in the favor of Brazil.

United Kingdom exports fell off 12.8 per cent in quantity.

Consul George H. Pickerell, at Para, reports that the total exports of crude rubber from Para and Manaos during May, 1917, amounted to 9,219,605 pounds compared with 7,314,826 pounds for the same month in 1916. Shipments to the United States aggregated 7,690,816 pounds and to Europe 1,528,789 pounds, compared with 5,884,222 and 1,430,604 pounds, respectively, last year. There were no shipments from Itacoatira, Brazil.

The several grades of rubber exported are shown in the following table:

	From Para.		From Manaos.	
Grade.	To United States.	To Europe.	To United States.	To Europe.
Fine .....*pounds*	1,710,727	565,905	570,082	315,042
Medium	194,820	14,375	125,970	148,587
Coarse	1,220,651	27,118	350,625	13,081
Caucho	2,321,412	136,964	1,196,529	307,717
Totals	5,447,610	744,362	2,243,206	784,427

THE TIRE TRADE OF ARGENTINA.

As a measure to prevent German resumption of the tire supply of Argentina after the war "The Commercial Motor" points out that the *Germans own extensive rubber estates in Para, Brazil, and that it would be to the advantage of British manufacturers to control their sources of rubber supply in a similar manner. While about 75 per cent of the automobiles are of British manufacture and Dunlop and North British tires were well represented, the German Continental tire people were gradually getting the bulk of the trade.

Road conditions in Argentina are improving under the able directorship of British managers of the Argentine railways, many of which have formed a road board and are setting aside regularly 3 per cent of their gross earnings for the improvement and maintenance of the main roads and byways linking the up-country farms with the principal railway depots. Responding to this stimulus, the future trade in pleasure and commercial motor vehicles and accessories of every sort promises to be brisk. It has been predicted that a large measure of South American development will be due to heavy motor lorries, and already there is beginning to be a field for the sturdiest 3 and 5-ton American trucks, our lighter commercial vehicles having failed to stand up under the necessarily hard usage. The dispatch, during the past four years, of no fewer than six American commissions to Argentina, indicates that manufacturers in the United States are not altogether neglecting their trade opportunities with sister republics of the western hemisphere.

BRITISH HONDURAS INCREASES CHICLE EXPORT TAX.

By an ordinance in effect June 16, 1917, the duty on chicle exported from British Honduras is increased from ½ cent to 1½ cents per pound. Statistics for the exports during 1916 have not yet been published in Honduras, but in 1915 there was exported 3,467,696 pounds of chicle gum, valued at $1,231,655. The imports of chicle gum from British Honduras into the United States during the fiscal year 1916 amounted to 712,288 pounds, valued at $248,067, while the imports from Canada, which also originate in British Honduras, amounted in the same year to 2,152,933 pounds, valued at $1,214,963.

RUBBER GOODS IN THE DOMINICAN REPUBLIC.

The total imports of rubber and rubber manufactures of the Dominican Republic amounted to $58,547 for the year 1916 as compared to $34,676 for the year 1915. This substantial increase of $23,871 indicates a growing use of rubber goods in the island republic. Of the 1916 total, goods to the value of $56,752 came from the United States. Porto Rico was the next largest source, its business amounting to $1,668.

*Our esteemed contemporary is surely misinformed in this particular.—THE EDITOR.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED JUNE 19, 1917.

NO. 1,230,112. Vaginal support. D. G. Carey, Elmira, N. Y.
1,230,122. Billiard cue tip, comprising both hard and soft rubber sections. I. J. Connell, Detroit, Mich.
1,230,182. Demountable rim lock. E. Lindberg, Rice Lake, Wis.
1,230,284. Dental rubber dam holder and cutter. O. B. Elkins and M. S. Smith, assignors of one-fourth to N. Statham—all of Abbeville, Ga.
1,230,290. Life preserver comprising an inflating gas container. B. A. Geiger, Chicago, Ill.
1,230,333. Laminated, cohesive, interwound, bonded fabric for tires. L. A. Subers, East Cleveland, Ohio.
1,230,508. Non-skid device for vehicle tires, comprising a rubber stud. I. E. Peden, New York City, assignor of one-half to T. F. Smith, St. Paul, Minn.
1,230,518. Manufacture of brushes the bristles of which are held by vulcanized rubber. E. E. Robinson, Belleville, N. J., assignor to Hanlon & Goodman Co., New York City.
1,230,543. Means for expanding and contracting demountable rims. J. H. Wagenhorst, Akron, Ohio.
1,230,589. Pencil and pen holder having rubber plugs. J. J. Macnorius, Kenosha, Wis.
1,230,606. Quick detachable hose coupling. W. McQuigg Saunders, Evansville, Ind.
1,230,616. Rim and wheel for solid rubber tires. A. C. Stevenson, Scotstoun, Glasgow, Scotland.
1,230,650. Abdominal belt. F. G. Baugatz, Paris, France.
1,230,683. Elastic finger cot for cleaning teeth. J. A. Daly, New Rochelle, N. Y.
1,230,690. Pneumatic cushion. A. C. Eggers, Brooklyn, N. Y., assignor to The Goodyear's India Rubber Glove Manufacturing Co., Naugatuck, Conn.

ISSUED JUNE 26, 1917.

1,230,854. Hose coupling. E. F. J. Breuer, Decatur, Ill.
1,230,858. Gas cartridge apparatus for inflating life-preserving belts. W. G. Brokaw, Paris, France.
1,230,902. Tire fastening device. F. P. Johnson, Danville, Pa.
1,230,967. Manufacture of block tires. C. B. Whittelsey, assignor to The Hartford Rubber Works Co.—both of Hartford, Conn.
1,231,025. Self-supporting garment comprising an elastic belt. G. Ingham, Fairview, W. Va.
1,231,141. Fabric for printers' blankets and other purposes. F. E. Ellis, Revere, Mass.
1,231,142. Packing for printing presses. F. E. Ellis, Revere, Mass.
1,231,166. Milking machine teat cup. H. R. Jenkins, Eltham, New Zealand.
1,231,256. Fountain pen. M. E. Heilbrun, New York City.
1,231,296. Resilient heel formed with a suction cup. A. F. Priest, Oak Park, Ill.
1,231,299. Cushion heel for boots and shoes. M. Rieckmann, Springfield, Mass.
1,231,314. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City, one-fifth to The Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.
1,231,332. Ankle support and protector. H. J. Collis, Taunton, Mass.
1,231,446. Tire bead. W. C. Stevens, assignor to The Firestone Tire & Rubber Co.—both of Akron, Ohio.
1,231,505. Hand stamp. W. J. Denney, assignor of one-half to W. E. Boyer—both of Malone, N. Y.
1,231,530. Valve ball. F. T. Roberts, assignor to The Paramount Rubber Co.—both of Cleveland, Ohio.
1,231,538. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio.
1,231,539. Vehicle wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of two-fifths to The B. F. Goodrich Co., New York City, one-fifth to The Goodyear Tire & Rubber Co., Akron, Ohio, and one-fifth to the United States Tire Co., New York City.
1,231,548. Tire valve. E. V. Myers, East Orange, N. J., assignor to A. Schader's Son, Inc., Brooklyn, N. Y.

ISSUED JULY 3, 1917.

1,231,568. Electric cable. L. Clark, Englewood, N. J.
1,231,612. Pneumatic tire. O. P. Hoyt, Monroe, N. Y.
1,231,644. Demountable rim. M. F. Patton, Tuscaloosa, Ala.
1,231,748. Teat cup. H. A. Kricke, Crows Landing, Calif.
1,231,777. Cushion pneumatic heel. O. Mussinan, New York City.
1,231,780. Auto wheel having a rim in four sections, each with a solid rubber tire. J. G. Oehler, St. Louis, Mo.
1,231,931. Cushion tire. I. Normandy, St. Catharines, Ontario, Canada.
1,231,957. A pneumatic automobile tire. J. C. Smith, assignor of twenty-four one-hundredths to C. W. Head and twenty-five one-hundredths to B. Garcia—all of Mobile, Ala.
1,232,000. Door stop. F. H. Chase, assignor of one-half to J. W. Talbot—both of Chicago, Ill.
1,232,057. Inflatable arm rest for crutches. A. G. Lineback, Falls City, assignor of one-fourth to J. R. Chambers, one-fourth to Ida Davenport and one-fourth to Sarah Lineback, Albany—all in Oregon.
1,232,075. Flexible brush comprising a rubber strip. E. B. Oates, Paterson, N. J.
1,232,100. Pneumatic tire. O. Schutz, New York City.
1,232,272. Inflation valve cap. C. Frazier and J. Ashmore—both of Biggs, Ill.
1,232,277. Waterproof hat protector. I. Glaser, Washington, D. C.
1,232,292. Rim tool. C. H. Guiles, Addison, N. Y.
1,232,306. Means for securing in place and rendering useful deflated pneumatic tires. W. H. Heron, Washington, D. C.
1,232,406. Vehicle tire. C. W. Stewart, Martinsburg, W. Va.

ISSUED JULY 10, 1917.

1,232,509. Reinforced rubber sole. O. C. Davis, Brockton, Massachusetts.
1,232,518. Rubber heel. E. J. Emery, Portsmouth, N. H.
1,232,592. Tire valve. T. W. Morris, assignor of one-half to G. B. Dryden—both of Chicago, Ill.
1,232,726. Pneumatic tire valve. S. C. Sladden, New York City.
1,232,790. Heel. I. Gilbert, Chicago, Ill.
1,232,887. Filler for tires. R. B. Bostwick, Cleveland, Ohio.
1,232,906. Resilient tire. A. M. Ferguson, Rochester, N. Y., assignor to W. Keyel, Penfield, N. Y.
1,232,981. Emergency rim. H. C. Sampson, San Francisco, and A. F. Farman, Oakland—both in Calif.
1,233,051. Rubber bumper. P. H. Gundermann, Chicago, Ill.
1,233,143. Cushion tire. A. Teresa, assignor of one-third to M. Prieto and one-third to M. Goizueta—all of Habana, Cuba.
1,233,160. Combined life preserver and diving suit. C. S. Altoonian, Providence, R. I.
1,233,277. Tire. O. A. Kottemann, St. Louis, Mo., assignor of forty-nine one-hundredths to E. A. Holz, C. L. Case, J. C. Holz and J. H. Jones.
1,233,278. Tire. D. A. Messner, assignor of one-third to S. A. Messner—both of Akron, Ohio.
1,233,279. Tire. D. A. Messner, assignor of one-third to S. A. Messner—both of Akron, Ohio.
1,233,283. Vehicle-wheel rim. J. H. Wagenhorst, Akron, Ohio, assignor of one-fifth to The Goodyear Tire & Rubber Co., a corporation of Ohio, one-fifth to The United States Tire Co., and two-fifths to The B. F. Goodrich Co.—both corporations of New York.

THE UNITED KINGDOM.

ISSUED JUNE 6, 1917.

105,385. Rubber galvanic batteries. C. C. Rattey, "Logan," Seagry Road, Wanstead, Essex.
105,412. Ply boards or sheets comprising wood veneers and waterproof fabric. S. E. Saunders, White House, East Cowes, Isle of Wight.
105,424. Tire tool. A. A. Friestedt, 2934 West Lake street, Chicago, Illinois, U. S. A.
105,441. Convertible military garment and tent. E. F. Brown, 591a Yonge street, Toronto, Ontario, Canada.
105,459. Rubber-covered vacuum-flask stoppers. F. E. and G. Harris, 46 Sydner street, Stoke Newington, London.
105,473. Game comprising an apparatus with rubber base. J. H. Adams, Rotton Park Road, Edgbaston, Birmingham.

ISSUED JUNE 13, 1917.

105,512. Corset having a section of elastic material. D. Kops, 525 West End avenue, Manhattan, New York, U. S. A.
105,537. Wheel comprising a solid tread member and a number of pneumatic tubes. G. S. Gallagher, 672 St. Nicholas avenue, Manhattan, New York, U. S. A.
105,577. Seamless hot water bottle. F. C. Jones, 24 Belvedere Road, Upper Norwood, Surrey.
105,684. Detachable rim. H. F. Cox and M. V. Powell, 333 West Ninth street, Flint, and V. F. Brown, North Lincoln avenue, Bay—both in Michigan, U. S. A.

ISSUED JUNE 20, 1917.

105,733. Repairing rubber soles and heels. W. Jackson, Patent Fibre Co., of Singapore, Straits Settlements.
105,735. Hot water bottle. F. C. Jones, 24 Belvedere Road, Upper Norwood, Surrey.
105,741. Cover for pneumatic tire, comprising tread blocks. C. Jordan, 168 Homeward avenue, Pittsburgh, Pennsylvania, U. S. A.
105,796. Tire casing comprised of rawhide, gutta percha coated, layers of rubber and balata impregnated canvas. A. A. Crozier, 3 Woodquest avenue, Herne Hill, London.

Chemical Patents will be found on page 650. Machinery and Process Patents on pages 653-654.

105,843. Helmet comprising rubber tubes. A. F. Bargate, 20 Lawrence Lane, London.

105,866. Non-slip bath mat. W. H. E. Clarke, 6102 Market street, Philadelphia, Pennsylvania, U. S. A.

THE DOMINION OF CANADA.

ISSUED MARCH 31, 1917.

175,445. Brassiere having an elastic section. B. and H. Prince—both of New York, New York, U. S. A.

175,467. Hose coupling comprising fabric hose sections. N. B. Braly, Butte, Montana, U. S. A.

175,485. Cord tire. F. S. Dickinson, New York, New York, U. S. A.

175,507. Corset comprising an elastic section. D. Kops, New York, New York, U. S. A.

175,581. A tire having an outer and an inner section made of tough flexible material, and an intermediate section of soft rubber. The Pearce-Arrow Tire & Rubber Manufacturing Co., assignee of A. L. Pearce—both of Philadelphia, Pennsylvania, U. S. A.

175,604. Heel pad for boots and shoes. J. A. Adams, assignor, Toronto, and E. A. Adams, assignee of all the title, Montreal, Quebec.

175,613. Tire protector. W. E. Wilson and S. S. Wilson—both of Des Moines, Iowa, U. S. A.

175,629. Life preserver. W. Bruce, Walla Walla, Washington, U. S. A.

175,631. A container for a stack of tires. W. R. Busenbark, Akron, Ohio, U. S. A.

175,648. Tire shoe. J. C. Fickes, Steubenville, Ohio, U. S. A.

175,666. Truss comprising a rubber pad. D. McKay, Collingwood, Ontario.

175,679. Air cooled pneumatic tire. I. Normandy, St. Catharines, Ontario.

175,688. Block tire. C. A. Simons, Albany, New York, U. S. A.

175,758. Pneumatic tire pressure gage. C. Harrison and K. Lamond—both of Vancouver, British Columbia.

175,953. Pneumatic tire armor. J. J. Kent, Dundas, Ontario.

175,966. Catamenial support. W. K. Lyall, Montreal.

175,987. Tennis ball. F. W. Stockton, Chicago, Illinois, U. S. A.

NEW ZEALAND.

ISSUED MAY 17, 1917.

37,416. Milking machine teat cup. J. A. Mawston, Pine Grove Farm, Waerenga Valley, Waikato.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION.)

482,704 (August 30, 1916). Flexible metal bands for rubber wheel-tires. De Navailles-Labatut.

482,746 (July 21, 1916). Wheel with removable crown having rubber tire. Cox, Powel & Brown.

482,770 (September 2, 1916). Improvements in elastic wheels. W. E. Superman.

482,797 (September 6, 1916). Pneumatic tires for cycles, automobiles, etc. P. Harder.

482,805 (September 6, 1916). Improvements in inflating valves of pneumatic and similar tires. H. S. Land.

482,861 (March 22, 1916). Utilization of old pneumatic tires for making soles of boots, shoes, etc. U. Chaudeysson.

482,903 (September 18, 1916). Elastic tire for carriage wheels. G. Kanter.

482,919 (September 20, 1916). Tire device for wheels of automobiles and other vehicles. R. Blakoe.

TRADE-MARKS.

THE UNITED STATES.

103,173. The compound word ON-THE-LEVEL—rubber heels. E. S. Helwitz, Brooklyn, N. Y.

103,263. The compound word OX-HEART over a representation of leaves and fruit—chewing gum. D. D. Long, Oswego, N. Y.

103,317. The words OLD HICKORY—rubber tires for automobiles. W. B. Buckley, New York City.

103,378. The word AROMINT—chewing gum. The Aromint Co., Cincinnati, Ohio.

103,572. C B S Co. arranged within a shield design—rain coats. C. B. Shane Co., Chicago, Ill.

97,448. The word WEAREVER—rubber sponges. The Faultless Rubber Co., Ashland, Ohio.

102,362. The word FORMALITH—pacifiers. J. Schmid, Inc., New York City.

102,686. The letter M within a shield design—ice caps, water bottles, combination water bottles and fountain syringes, invalid cushions, rubber urinals, and fountain syringes. The Mechanical Rubber Co., New York City, Chicago, Ill., and Cleveland, Ohio.

103,977. The number 1 within a cone-shaped design—chewing gum. Common Sense Gum Co., New York City.

103,978. The number 5 within a cone-shaped design—chewing gum. Common Sense Gum Co., New York City.

100,940. The compound word MER-RA above a monogram design—rubber and fabric hose, rubber belting, rubber packing. Southern Railway Supply & Equipment Co., St. Louis, Mo.

101,336. Representation of a flying duck within a rubber tire—tire fabric, canvas, sail cloth, tent cloth, cotton bagging. Katama Mills, Boston, Mass.

101,839. The word THERMOID—tires, hose and mechanical rubber goods. Thermoid Rubber Co., Hamilton township, Mercer County, N. J.

102,406. A representation of a tire—boots and shoes made of rubber and canvas. Converse Rubber Shoe Co., Malden, Mass.

85,769. The word HIDALGO—rubber. Acushnet Process Co., New Bedford, Mass.

101,920. The word APEX in a triangular-shaped design—rubber boots and shoes. Goodyear Rubber Co., Middletown, Conn.

103,148. The word ITSAGO—sheet packing, piston packing and gaskets composed of or containing rubber. La Favorite Rubber Manufacturing Co., Paterson, N. J.

104,297. The words STORM HERO—waterproof outer clothing. B. Fligel, New York City.

THE UNITED KINGDOM.

ISSUED JUNE 6, 1917.

376,886. Representation of a life preserver with the words TRADE MARK on it and the word DICKEALATA in the center—boots and shoes made with balata soles. R. & J. Dick, Limited, 3 McPhail street, Greenhead, Glasgow.

377,625. The word KORTIT—all goods included in class 40. D. Moseley & Sons, Limited, Chapel Field Works, Chapel Field Lane, Ardwick, Manchester.

374,551. The letters N B R C LD at the top of and the word EDINBURGH beneath a representation of plaid draperies, surrounding a shield on which is a design consisting of a sword and scales. The North British Rubber Co., Limited, Castle Mills, Fountainbridge, Edinburgh, Scotland.

377,203. Representation of a railroad train—goods manufactured from india rubber and gutta percha, not included in other classes but not including elastic fabrics and not including any goods of a like kind to elastic fabrics. Noorbhai Jivaji, 435 and 437 Bhendy Bazar, Bombay, India.

377,082. The word RUSSAM within a diamond-shaped design—reclaimed india rubber and similar substances. Stead-Hunt, Limited, Fielding Mills, Fielding street, Middleton, near Manchester.

377,244. The word GEM—machines for treating crude and partly prepared india rubber. Summerscales, Limited, Phoenix Foundry, Royd Lane, Beechcliffe, and Coney Lane Works, Coney Lane—both in Keighley, Yorkshire.

376,332. The word MULTICO—all goods included in class 40. Standard Woven Fabric Co., South street, Walpole, Norfolk County, Massachusetts, U. S. A.

376,978. The word HAGIDE—india rubber sheeting. T. F. Atkinson, 43 Esme Road, Sparkhill, Birmingham.

378,079. The word FENWAY—goods manufactured from india rubber and gutta percha. United Drug Co., 43 Leon street, Boston, Massachusetts, U. S. A.

THE DOMINION OF CANADA.

22,415. The word ORIOLE—erasers. S. B. Beare, Limited, Toronto, Ontario.

22,438. The words SMILES AT MILES—rubber tires, inner tubes, valve patches, inner cases and rubber tubing of all descriptions. Lee Tire & Rubber Co., Whitemarsh, County of Montgomery, Pennsylvania, U. S. A.

NEW ZEALAND.

13,774. The word GOODYEAR divided by a representation of a winged foot—rubber hose. The Goodyear Tire & Rubber Co., Akron, Ohio, U. S. A.

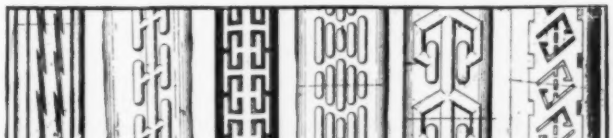
DESIGNS FOR TIRES.

THE UNITED STATES.

50,931. Tire tread. Term 14 years. Patented June 19, 1917. F. B. Carlisle, North Kingston, R. I., assignor to J. M. Gilbert, New York City.

50,956. Pneumatic tire. Term 14 years. Patented June 19, 1917. R. M. Pierson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

50,961. Tire tread. Term 14 years. Patented June 19, 1917. L. T. Vance, assignor to Racine Rubber Co.—both of Racine, Wisconsin.



50,931 50,956 50,961 50,976 50,977 51,013

50,976. Pneumatic tire. Term 14 years. Patented June 26, 1917. R. M. Pierson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

50,977. Pneumatic tire. Term 14 years. Patented June 26, 1917. R. M. Pierson, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

51,013. Tire tread. Term 14 years. Patented July 10, 1917. F. T. Faircloth, San Francisco, Calif.

Review of the Crude Rubber Market.

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NEW YORK.

THE crude rubber market has been dull in a general way throughout the entire month; however, in some quarters a fairly active business was reported. This fairly reflects the condition of the rubber mills, many of which are running night and day on war orders, while others have slowed down for repairs and inventories usual at this time. As a whole, the rubber industry is unusually busy, with government business as the prime mover.

The interest of manufacturers was almost entirely confined to inquiries for the various positions in 1918 and the actual volume of business transacted in futures was undoubtedly small. The fact is, producers are not at all anxious to quote or sell futures, due to the difficulties that encompass shipping and the uncertainties of ocean freight rates. There are, moreover, other reasons; for instance, producers are confronted with war taxes that will be increased and to what extent no one knows, as the war pressure grows heavier. Overhead costs, price of exchange, packing and handling charges may also be augmented through unforeseen circumstances and the burden will fall on the producer who would be forced to fill his "future" contracts at a loss.

Prices for spot plantation grades were steady and small price changes recorded during the early part of the month, when later, following the upward swing in London, the local market became firmer and prices advanced.

On July 5 First latex crêpe and Smoked sheet ribbed was 67 cents for spot and nearby. October-December, 66 cents; January-June, 65½ cents, and January-December, 65 cents. Brazilian sorts were devoid of interest, Upriver fine being quoted 69 cents. The tendency of the market was downward as the month progressed and with minor fluctuations obeying dominant London, prices were practically unchanged as the last week of July was brought to a close. On July 28, First latex crêpe spot was quoted 67½ cents, Smoked sheets ribbed, 67 cents, while futures for both grades for all positions, including next year, were 67 cents. Brazilian sorts were dull with Upriver fine at 68½ cents.

LONDON.

A fair demand and sufficient supplies were the reasons for the firm conditions that have ruled the London market during the past month. The consuming interests have been content with supplying their immediate requirements from available stocks at ruling spot prices but have not been attracted to any great extent by the present future offerings. The consumers are waiting for lower prices, supported by the promise of a heavy crop next year, while the producers, faced with uncertainties attending production costs, are unwilling to sell too far ahead.

Standard crêpe spot was selling on July 5 at 30*d.* and Smoked sheets at 29¾*d.* August-September was quoted 31*d.* and October-December 32*d.* Fine hard Para spot was quiet at 36*d.* The market continued steady, with firm prices and minor changes in value, until the end of the month. On July 28, Standard crêpe was quoted 30¾*d.* and Smoked sheet 30½*d.*

London and Liverpool imports for May were 6,700 tons compared with 10,000 tons for April. Reexports for May were 6,093 tons against 8,200 tons for April.

SINGAPORE.

There has been little demand during the month of July in the Singapore market and price values have steadily shown a downward tendency. At the auctions held June 29, July 7, 13 and 20, the average prices realized were as follows: First latex crêpe, 56.09 cents, compared to 59.7 cents a month ago. Smoked sheets ribbed, 55.14 cents, compared to 60.19 cents last month. The total amount sold was 1,628 tons, compared to 1,549 tons sold a month ago.

NEW YORK SPOT QUOTATIONS.

	August 1, 1916.	July 1, 1917.	July 28, 1917.
PLANTATION PARAS—			
First-latex crêpe / *Hevea first crêpe	66½@	65½@	67 @
Amber crêpe No. 1, pale gristly blanket	56 @	63 @	65 @
Amber crêpe No. 2	@	62 @	64 @
Amber crêpe No. 3	@	61 @	63 @
Amber crêpe No. 4	@	60 @	62 @
Brown crêpe, thick clean	54 @	60 @	62 @
Brown crêpe, thin clean	@	60 @	61 @
Brown crêpe, thin specky	@	58 @	59 @
Brown crêpe, rolled	@	53 @	48 @
Smoked sheet, ribbed standard quality / *Hevea ribbed smoked sheets	57½@	65½@	67 @
Smoked sheet, plain standard quality / *Hevea plain or smooth smoked sheets	@	64 @	64 @64½
Unsmoked sheet, standard quality / *Hevea unsmoked sheets	@	62 @	62 @62½
Colombo scrap, No. 1	@	49 @	49 @49½
Colombo scrap, No. 2	@	45 @	45 @45½
BRAZILIAN PARAS—			
Upriver fine	66½@	69 @	68½@69
Upriver medium	@	63 @	63 @
Upriver coarse	40¾@	49 @	48½@
Upriver weak fine	@	60 @	59 @
Upriver caucho ball	41 @	44 @	42½@
Islands fine	59 @	66 @	61 @
Islands medium	@	58 @	58 @
Islands coarse	28½@	34 @	30 @
Islands weak fine	@	55 @	55 @
Cameta	32 @	34 @	32½@
Lower caucho ball	36 @	41 @	39 @40
Peruvian fine	@	67 @	66 @
Tapajos fine	@	67½@	66 @
Tapajos caucho ball	@	40 @	39½@
AFRICANS—			
Accra flake	33 @	31 @	31 @
Niger flake	@	31 @	31 @
Benguela, extra seconds, 28%	@	41 @	39 @
Benguela, No. 2, 32½%	35½@	38 @	37½@
Congo prime, black upper	@	58 @	56 @
Congo prime, red upper	@	54 @	53 @
Rio Nunez ball	@	65 @	64 @66
Rio Nunez sheets and strings	@	64 @	64 @66
Conakry niggers	53 @	64 @	64 @
Massai sheets and strings	@	64 @	64 @
CENTRALS—			
Central scrap	34 @	45 @	42 @43
Central scrap and strip	38 @	44 @	41 @42
Central wet sheet	30 @	33 @	31 @
Corinto	41 @	44 @45	43 @
Esmeralda sausage	40 @	46 @	43 @
Guayule	35 @	35 @	36 @
MANICOBAS—			
Ceara negro heads	@	42 @	44 @48
Ceara scrap	@	32 @	27 @28
Manicoba special	42½@	37½@	45 @
Manicoba extra	@	35 @	42½@
Manicoba regular	@	33 @	37½@
Mangabeira thin sheet	40 @	40 @	39 @
Mangabeira thick sheet	@	37½@	35½@36
BALATA—			
Balata block	41 @	67 @	58 @64
Surinam sheet	72½@	78 @	85 @92
EAST INDIAN—			
Assam crêpe	@	64 @	63 @
Assam onions	@	59 @	61 @
Penang block scrap	@	42 @	41 @
Pontianak pressed	15 @	18 @	18 @
Bandjermassin	8 @	11 @	11 @
Gutta Siak	18 @19	19 @	19½@
Gutta percha, red Macassar	2.50@	2.20@	2.30@

* Rubber Association of America nomenclature.

COMPARATIVE NEW YORK PRICES FOR JULY.

In regard to the financial situation, Albert B. Beers (broker in crude rubber and commercial paper, No. 68 William street, New York), advises as follows:

"During July the market for commercial paper has been very uncertain, most banks being in the market only occasionally off and on, and rates have been 5@5½ per cent on the best rubber names and 6@6½ per cent for those not so well known."

	1917.*	1916.	1915.
Upriver, fine	68@71	65@68	59@63
Upriver, coarse	48@50	41@42	44@47
Islands, fine	66@69	58@59	52@54
Islands, coarse	28@30	26@28	28@30
Cameta	31@33	33@34	31@32

* Figured only to July 26.

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

Date.	Crêpe price per lb.	Smoked sheet price per lb.	Tons sold.	Market.
June 29	*cents* 55.25	53.97	389	Firmer with more inquiry.
July 7	56.52	56.52	475	Weaker and tendency downward.
July 13	56.52	55.67	365	Weaker.
July 20	56.10	54.40	399	Little demand and prices weak.

MARKET CABLE SERVICE FROM LONDON.

The following market report has been cabled from Alden's Successors, Limited, London:

	Standard Crêpe.	Ribbed Smoked Sheets.	Market.
June 25	29¼*d.*	29*d.*	Dull
July 2	29½*d.*	29¼*d.*	Steady
July 9	30*d.*	29½*d.*	Steady
July 16	30*d.*	29½*d.*	Firm
July 23	31*d.*	31½*d.*	Firm

WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [June 1, 1917]:

The weekly rubber auction opened yesterday with a good demand for high-grade rubber, fine pale crêpe selling up to $152, and ribbed smoked sheet to $150 per picul. At the continuation of the sale today the demand was maintained, one lot of ribbed smoked sheet fetching $151 per picul. The top price for fine pale crêpe is the same as last week's, and that for ribbed smoked sheet is $1 down. For palish, brown and dark crêpes there was a brisk demand at relatively good prices, but inferior lots of smoked sheet were neglected, and a considerable quantity was brought in. Unsmoked sheet met with a moderate demand, at about last week's prices. Of 800 tons cataloged, 453 tons were sold.

The following was the course of values:

	In Singapore per Picul.*	Sterling Equivalent per Pound in London.	Equivalent per Pound in Cents.
Sheet, fine ribbed smoked	$145@151	2/11 @3/ ¼	61.62@64.17
Sheet, good ribbed smoked	130@145	2/ 7¾@2/11	55.25@61.62
Sheet, plain smoked	120@129	2/ 5¾@2/ 7¾	51.00@54.82
Sheet, ribbed unsmoked	118@132	2/ 5¼@2/ 8¼	50.15@56.10
Sheet, plain unsmoked	115@125	2/ 4⅛@2/ 6¼	48.87@53.12
Crêpe, fine pale	149@152	2/11¾@3/ ⅛	63.32@64.60
Crêpe, good pale	137@149	2/ 9¼@2/11¾	58.22@63.32
Crêpe, fine brown	131@140	2/ 8 @2/ 8⅞	55.67@59.50
Crêpe, good brown	120@130	2/ 5¾@2/ 7¾	51.00@55.25
Crêpe, dark	100@121	2/ 1½@2/ 5⅞	42.50@51.42
Crêpe, bark	68@104	1/ 6¾@2/ 2¾	28.90@44.20
Scrap, virgin and pressed	60@ 92	1/ 5⅛@1/11⅞	25.50@39.10
Scrap, loose	80@ 81	1/ 9¼@1/ 9½	34.00@34.42

* Picul = 133⅓ pounds.
Quoted in S. S. dollars = 2/4 [56.7 cents].

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1917 to dates named, excluding all foreign transhipments, Reported by Barlow & Co., Singapore.)

To—	From Singapore. April 30, 1917.	Malacca. April 30, 1917.	Penang. April 30, 1917.	Port Swettenham. May 22, 1917.	Totals.
United Kingdom. *lbs.*	16,666,056	1,757,231	10,197,667	16,463,387	45,084,341
The Continent	5,926,148	....	47,067	....	5,973,215
Japan	1,291,842	....	....	....	1,291,842
Ceylon	152,334	....	223,732	454,727	830,793
U. S. and Canada	40,132,832	....	6,220,200	553,264	46,906,296
Australia	185,413	....	....	....	185,413
China (Hongkong)	....	....	....	47,052	47,052
Totals	64,354,625	1,757,231	16,688,666	17,518,430	100,318,952
Same period, 1916	44,699,753	1,538,534	10,879,900	8,855,995	75,974,182
Same period, 1915	20,651,757	3,276,002	8,230,797	10,915,581	44,074,137
Same period, 1914	12,167,672	1,772,527	5,398,000	10,860,277	30,198,476

EXPORTS OF PARA RUBBER FROM PENANG.

MAY 1-23, 1917.

To—	Pounds.
UNITED STATES:	
Seattle	851,600
Akron	509,466
New York	346,400
San Francisco	9,066
Total	1,716,532
EUROPE:	
England—	
London	1,748,266
Liverpool	397,866
Total	2,146,132

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

April 20-30, 1917.

From—	Para Rubber. Para Rubber	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Malay Peninsula—					
Port Swettenham *lbs.*	826,000	.....	.....	.....	.....
Teluk Anson	717,200	.....	.....	.....	.....
Muar	320,533	.....	.....	.....	.....
Penang	212,666	273,866	.....	.....	.....
Malacca	132,000	310,133	.....	.....	.....
Port Dickson	92,933	.....	.....	.....	.....
Kelantan	62,666	.....	.....	.....	.....
Kuantan	21,733	.....	.....	.....	.....
Rengat	6,933	5,466	.....	.....	.....
S. Pandjang	533	.....	.....	.....	.....
Totals	2,393,186	589,465	.....	.....	.....
Borneo—					
Bandjermassin	69,333	.....	3,066	50,533	133,333
Sarawak	67,333	.....	2,133	17,066	475,466
Pontianak	43,066	2,533	1,466	4,000	49,600
Labuan	23,866	.....	.....	30,000	.....
Sambas	20,000	.....	.....	.....	.....
Jesselton	14,800	99,866	.....	266	.....
Passir	12,666	.....	.....	.....	.....
Sandakan	7,333	5,200	.....	.....	.....
Kudat	3,866	.....	.....	.....	.....
Singkawang	3,333	.....	.....	.....	.....
Samarinda	1,866	.....	3,733	1,600	.....
Sampit	1,333	.....	14,666	.....	221,466
Totals	268,795	107,599	25,064	103,465	879,865
Sumatra—					
Djambi	156,000	.....	.....	.....	.....
Deli	118,433	466,800	.....	.....	.....
Palembang	19,600	.....	.....	.....	23,333
Asahan	7,733	95,200	.....	.....	.....
Siak	5,333	.....	.....	.....	.....
Indragiri	2,933	.....	.....	.....	.....
Muntok	933	.....	.....	.....	.....
Totals	310,965	562,000	.....	.....	23,333
Java—					
Sourabaya	8,133	.....	.....	.....	.....
Batavia	2,266	.....	.....	.....	.....
Samarang	1,600	.....	.....	.....	.....
Total	11,999	.....	.....	.....	.....
Siam—					
Patani	133	.....	.....	.....	.....
Bangkok	.....	.....	.....	8,000	.....
Totals	133	.....	.....	8,000	.....
Burma—					
Mergui	4,666	.....	.....	.....	.....
Other ports	91,466	67,733	3,333	21,200	153,333
Grand Totals	3,081,210	1,326,797	28,397	132,665	1,056,531

EXPORTS.

April 20-30, 1917.

To—	Para Rubber. Para Rubber	Para Rubber Trans-shipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
NORTH AMERICA:					
United States—					
Akron	929,866	35,866	.....	.....	.....
New York	602,000	161,333	.....	.....	.....
Seattle	347,466	.....	.....	56,000	.....
San Francisco	190,400	.....	.....	.....	.....
Boston	168,000	.....	.....	.....	.....
Canada—					
Vancouver	563,066	.....	.....	.....	.....
Totals	2,800,798	197,199	.....	56,000	.....
EUROPE:					
United Kingdom—					
England (London)	384,800	.....	.....	124,400	.....
Grand Totals	3,185,598	197,199	.....	180,400	.....

IMPORTS.

May 1-24, 1917.

From—	Para Rubber.	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Malay Peninsula—					
Port Swettenham ...*lbs.*	1,435,866	.....	.....	.....	.....
Teluk Anson	944,000	.....	.....	.....	.....
Malacca	809,733	405,600	.....	.....	.....
Muar	581,333	.....	.....	.....	.....
Penang	474,600	127,600	.....	.....	.....
Port Dickson	110,400	42,000	.....	.....	.....
Kelantan	89,733	.....	.....	.....	.....
Rengat	37,333	20,800	.....	.....	.....
Kuantan	19,733	.....	.....	.....	.....
S. Pandjang	4,666	.....	.....	.....	.....
Tringganu	266	.....	.....	.....	.....
Totals	4,507,663	596,000	.....	.....	.....
Borneo—					
Sarawak	161,466	.....	1,066	10,933	796,266
Bandjermassin	110,666	31,466	22,000	60,266	188,533
Sibu	64,266	.....	1,200	2,133	228,800
Pontianak	62,666	4,133	4,000	15,066	36,000
Sambas	58,133	.....	.....	1,333	.....
Jesselton	39,600	215,200	.....	2,000	.....
Labuan	31,866	3,333	933	4,266	164,000
Sandakan	25,066	32,266	.....	.....	.....
Sampit	14,666	.....	.....	2,400	.....
Passir	11,733	.....	.....	.....	.....
Kudat	6,266	30,933	.....	.....	.....
Singkawang	4,133	.....	.....	.....	.....
Samarinda	3,066	.....	266	2,666	.....
Totals	593,593	317,331	29,465	101,063	1,413,599
Sumatra—					
Djambi	256,933	.....	.....	800	.....
Palembang	58,266	.....	.....	1,333	131,066
Deli	52,000	43,333	.....	.....	.....
Indragiri	18,533	.....	.....	.....	15,200
Bengkalis	10,933	.....	.....	.....	.....
Siak	7,466	4,533	.....	.....	.....
Muntok	6,266	.....	.....	.....	.....
Belawan	.....	150,000	.....	.....	2,666
Asahan	.....	99,600	.....	.....	.....
Totals	410,397	297,466	.....	2,133	148,932
Java—					
Sourabaya	68,000	.....	.....	.....	.....
Batavia	62,000	.....	.....	.....	.....
Samarang	433	.....	.....	.....	.....
Totals	130,433	.....	.....	.....	.....
Siam—					
Bangkok	1,066	.....	.....	.....	.....
Patani	933	.....	.....	.....	.....
Total	1,999	.....	.....	.....	.....
Burma—					
Rangoon	17,333	.....	.....	.....	.....
Other ports	233,866	234,533	19,466	17,866	160,666
Grand Totals	5,895,284	1,445,330	48,931	121,062	1,723,197

EXPORTS.

May 1-24, 1917.

To—	Para Rubber.	Para Rubber Trans-shipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
North America:					
United States—					
New York	3,232,533	1,324,666	.....	498,666	1,480,266
Akron	1,191,200	39,600	.....	.....	.....
Seattle	1,102,266	54,933	.....	77,200	921,600
San Francisco	219,333	4,533	.....	.....	.....
Boston	176,133	.....	.....	.....	.....
Canada—					
Montreal	1,352,000	.....	.....	.....	.....
Vancouver	563,866	.....	.....	.....	.....
Granby	26,933	.....	.....	.....	.....
Toronto	9,500	.....	.....	.....	.....
Totals	7,873,764	1,423,732	.....	575,866	2,401,866
Europe:					
United Kingdom—					
England—					
London	1,150,800	2,178,933	.....	67,466	19,866
Liverpool	306,266	357,333	.....	.....	.....
Russia (Vladivostok)	1,880,133	.....	.....	.....	.....
Italy (Genoa)	755,933	.....	.....	11,333	.....
France (Marseilles)	312,800	.....	.....	24,200	.....
Totals	4,406,932	2,536,266	.....	102,999	19,866
Grand Totals	12,280,696	3,959,998	.....	678,865	2,421,732

PLANTATION RUBBER EXPORTS FROM JAVA.

To—	April. 1916.	April. 1917.	Four Months Ending April. 1916.	Four Months Ending April. 1917.
Holland:				
Hevea .....*pounds*	.....	.....	29,120	.....
Great Britain:				
Ficus	4,594	1,533	8,470	4,571
Hevea	757,120	831,040	2,367,680	2,172,800
Ceara	4,354	6,514	16,427	12,707
Castilloa	5,889	6,264	18,832	13,272
Totals	771,957	845,351	2,411,409	2,203,350
United States:				
Ficus	28,175	.....	32,087	2,578
Hevea	2,374,400	1,933,120	5,427,520	10,868,480
Ceara	.....	.....	11,114	185
Castilloa	.....	.....	.....	7,060
Totals	2,402,575	1,933,120	5,470,721	10,878,303
Singapore:				
Ficus	5,282	1,430	17,796	7,027
Hevea	512,960	226,240	1,413,440	1,232,000
Ceara	594	550	11,812	12,082
Castilloa	110	.....	2,365	797
Totals	518,946	228,220	1,445,413	1,251,906
Other Countries:				
Ficus	.....	.....	1,672	.....
Hevea	38,080	4,480	112,000	15,680
Totals	38,080	4,480	113,672	15,680

STRAITS SETTLEMENTS RUBBER EXPORTS.

The export of plantation rubber from Straits Settlements ports in the month of May, as officially reported by cablegram from Singapore, amounted to 6,282 tons. Of this total, 928 tons were transhipments from adjacent countries. Appended are the comparative statistics for three years:

	1915.	1916.	1917.
January .....*tons*	2,576	4,443	3,562
February	2,741	3,359	6,495
March	2,477	4,481	8,299
April	1,978	4,219	6,103
May	3,588	3,274	6,282
Totals	13,360	19,776	30,741

The above figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements, such as Borneo, Java, Sumatra and the Malay States other than the Federated Malay States.

FEDERATED MALAY STATES RUBBER EXPORTS.

It is officially reported from Kuala Lumpur that the exports of plantation rubber from the Federated Malay States in the month of June amounted to 6,008 tons, which compares with 7,179 tons in May and 5,114 tons in the corresponding month last year. For the first half of the present year, the exports amounted to 39,471 tons compared with 27,091 tons in 1916 and 19,190 tons in 1915. Appended are the comparative statistics:

	1915.	1916.	1917.
January .....*tons*	3,473	4,471	5,995
February	3,411	5,207	7,250
March	3,418	4,429	7,084
April	2,777	3,914	5,955
May	2,708	3,956	7,179
June	3,403	5,114	6,008
Totals	19,190	27,091	39,471

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to May 28, 1917. Compiled by the Ceylon Chamber of Commerce.)

To—	1917.	1916.
United Kingdom .....*pounds*	12,999,165	7,721,711
France	1,322,371	586,650
Italy	33,600	.....
Russia	177,623	179,010
Western Australia	.....	56
South Australia	27	.....
Victoria	198,353	336,016
New South Wales	61,858	63,776
United States	7,161,914	11,594,584
Canada and Newfoundland	239,694	2,240
India	25	600
Japan	26,848	94,676
Totals	22,221,478	20,579,319

(Same period 1915, 17,077,193 pounds; same period 1914, 13,167,984 pounds.) The export figures of rubber, given in the above table for 1914, include the imports reexported. (These amount to 1,641,720—1,364,436 pounds from the Straits, and 265,660 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1916 and 1917 are for Ceylon rubber only.

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

The following statistics are not complete, due to Government orders prohibiting access to the records.

[The Figures Indicate Weight in Pounds.]

PARAS.

	Fine.	Medium.	Coarse.	Caucho.	Cameta.	Totals.
JUNE 18.—By the *Acre* from Para:						
H. A. Astlett & Co.	69,440	17,920	71,680	100,800	8,960	=268,800
JUNE 17.—By the *Vagland* from Para:						
H. A. Astlett & Co.	17,920	.....	15,680	.....	.....	= 33,600
Raw Products Co.	23,562	.....	.....	23,199	.....	= 46,761
JUNE 27.—By the *Tela* from Para and Manaos:						
Aldens' Successors, Ltd.	7,000	700	4,300	.....	.....	= 12,000
J. T. Johnstone & Co., Inc.	.....	660	6,720	9,000	.....	= 16,380
Hagemeyer & Brunn.	10,000	.....	3,300	1,000	.....	= 14,300
H. A. Astlett & Co.	.....	.....	17,920	.....	.....	= 17,920
Meyer & Brown.	35,300	7,100	13,500	54,400	.....	=110,300
JUNE 28.—By the *Ancon* from Mollendo:						
Muller, Schall & Co.	15,076	.....	1,314	.....	.....	= 16,390
JUNE 28.—By the *Gen. W. C. Gorgas* from Mollendo:						
Muller, Schall & Co.	.....	.....	.....	†10,023	.....	= 10,023

	Fine.	Medium.	Coarse.	Caucho.	Cameta.	Totals.
JULY 5.—By the *Sao Paulo* from Para:						
Aldens' Successors, Ltd.	8,200	400	10,000	22,000	.....	= 40,600
Muller, Schall & Co.	322	55	487	2,661	.....	= 3,525
Hagemeyer & Brunn.	.....	.....	5,000	.....	.....	= 5,000
H. A. Astlett & Co.	11,200	.....	.....	33,600	.....	= 44,800
Henderson & Korn.	78,500	1,200	5,000	6,200	2,000	= 92,900
Raw Products Co.	9,565	1,283	714	.....	.....	= 11,562
Meyer & Brown.	.....	.....	.....	80,400	.....	= 80,400
JULY 5.—By the *Minas Geraes* from Para:						
Henderson & Korn.	.....	.....	.....	30,000	.....	= 30,000
Raw Products Co.	25,972	10,275	63,769	.....	.....	=100,016
JULY 9.—By the *Tapajoz* from Para and Manaos:						
Muller, Schall & Co.	8,302	642	5,200	7,377	*353	= 21,874
Aldens' Successors, Ltd.	6,800	500	3,500	22,000	.....	= 32,800
Hagemeyer & Brunn.	33,600	.....	.....	25,000	12,000	= 70,600
H. A. Astlett & Co.	62,720	.....	44,800	170,240	.....	=277,760
Henderson & Korn.	30,000	2,000	20,000	28,000	11,000	= 91,000
Meyer & Brown.	59,100	12,600	22,100	44,200	.....	=138,000
JULY 14.—By the *Tricolor* from Para:						
Aldens' Successors, Ltd.	33,700	1,500	2,500	700	.....	= 38,400
General Rubber Co.	25,000	3,000	12,000	.....	.....	= 40,000
Hagemeyer & Brunn.	.....	.....	.....	.....	11,200	= 11,200
H. A. Astlett & Co.	76,160	6,720	24,640	145,600	22,400	=275,520
Henderson & Korn.	21,000	.....	.....	43,000	.....	= 64,000
Meyer & Brown.	.....	.....	3,400	53,800	.....	= 57,200
JULY 21.—By the *Vindeggen* from Para and Manaos:						
General Rubber Co.	103,000	8,700	2,100	112,000	.....	=225,800
Henderson & Korn.	.....	.....	.....	12,000	.....	= 12,000
H. A. Astlett & Co.	53,760	4,480	71,680	67,200	.....	=197,120
Meyer & Brown.	106,400	3,800	6,700	266,600	.....	=383,500

*Weak Fine.
†Upper Caucho Ball.

	Fine.	Medium.	Coarse.	Caucho.	Cameta.	Totals.
By the *Aagot* from Para:						
Raw Products Co.	.....	.....	.....	155,213	.....	=155,213

PLANTATIONS.

TO NEW YORK.

	Pounds.
JUNE 16.—By the *City of Athens*=Singapore:	
J. T. Johnstone & Co., Inc.	5,434
Raw Products Co.	15,680
JUNE 21.—By the *Minnehaha*=London:	
Rubber Trading Co.	33,700
Hagemeyer Trading Co.	13,440
JUNE 21.—By the *Pannonia*=London:	
L. Littlejohn & Co., Inc.	219,520
JUNE 27.—By the *Australia*=London:	
Aldens' Successors, Ltd.	573,400
Rubber Trading Co.	67,200
JUNE 23.—By the *Sardinia*=London:	
Rubber Trading Co.	22,400
J. T. Johnstone & Co., Inc.	155,320
JUNE 28.—By the *Lacaon*=London:	
Rubber Trading Co.	6,720
JUNE 28.—By the *Cyclops*=London:	
Rubber Trading Co.	11,200
JUNE 30.—By the *Kumeric*=East:	
Rubber Trading Co.	15,680
L. Littlejohn & Co., Inc.	112,000
JULY 1.—By the *Michigan*=London:	
L. Littlejohn & Co., Inc.	87,700
Rubber Trading Co.	56,000
Raw Products Co.	41,440
JULY 3.—By the *Euryades*=East:	
Rubber Trading Co.	179,200
J. T. Johnstone & Co., Inc.	586,490
Raw Products Co.	15,680
JULY 3.—By the *Columbia*=Ceylon:	
J. T. Johnstone & Co., Inc.	11,200
JULY 5.—By the *Mesaba*=London:	
L. Littlejohn & Co., Inc.	4,452
JULY 5.—By the *Vandalia*=London:	
L. Littlejohn & Co., Inc.	14,241
JULY 6.—By the *Carpathia*=London:	
L. Littlejohn & Co., Inc.	78,080
Meyer & Brown	23,300
JULY 7.—By the *Socrates*=London:	
L. Littlejohn & Co., Inc.	9,270
JULY 9.—By the *Bawean*=Java and Batavia:	
L. Littlejohn & Co., Inc.	116,480
J. T. Johnstone & Co., Inc.	597,932
General Rubber Co.	292,000
Hagemeyer Trading Co.	41,326
Raw Products Co.	8,201
JULY 12.—By the *Nippon*=Singapore:	
Henderson & Korn	514,600
JULY 13.—By the *Oanfa*=London:	
Aldens' Successors, Ltd.	63,422
JULY 14.—By the *Shinsei Maru*=Singapore:	
Henderson & Korn	51,500
JULY 16.—By the *Eurybates*=East:	
Hagemeyer Trading Co.	6,720
JULY 16.—By the *Kandahar*=Colombo: East:	
L. Littlejohn & Co., Inc.	33,600
Rubber Trading Co.	4,480
JULY 16.—By the *St. Bede*=London:	
L. Littlejohn & Co., Inc.	897
Meyer & Brown	6,100
JULY 17.—By the *Prinsder Nederlanden*=Paramaribo:	
Müller, Schall & Co.	435
JULY 17.—By the *Wakasa Maru*=East:	
Rubber Trading Co.	114,240
L. Littlejohn & Co., Inc.	501,760
JULY 17.—By the *Philadelphian*=London:	
L. Littlejohn & Co., Inc.	47,161
Hagemeyer Trading Co.	9,059
JULY 17.—By the *Adriatic*=London:	
L. Littlejohn & Co., Inc.	3,000
JULY 19.—By the *Ecuador*=Singapore:	
Henderson & Korn	46,000
JULY 21.—By the *Louis Nielsen*=Singapore:	
Henderson & Korn	136,000
JULY 23.—By the *Unkai Maru*=Singapore:	
Henderson & Korn	37,000
JULY 24.—By the *Manhattan*=London:	
Aldens' Successors, Ltd.	933,400
JULY 24.—By the *Malakuta*=London:	
Aldens' Successors, Ltd.	929,300
Meyer & Brown	4,500
JULY 26.—By the *Madiven*=Singapore:	
Henderson & Korn	57,000
JULY 27.—By the *Empress of Asia*=Singapore:	
Henderson & Korn	359,800
By the *Neleus*=Ceylon:	
J. T. Johnstone & Co., Inc.	83,918
By the *Karema*=East:	
Rubber Trading Co.	20,160
J. T. Johnstone & Co., Inc.	15,860
By the *Hyson*=Ceylon:	
J. T. Johnstone & Co., Inc.	6,720
By the *Goentoer*=Ceylon:	
J. T. Johnstone & Co., Inc.	54,682
By the *Empress of Japan*=East:	
Rubber Trading Co.	11,200
By the *Khyber*=East:	
Hagemeyer Trading Co.	13,780
By the *Deluana*=East:	
Hagemeyer Trading Co.	9,095
By the *Kangean*=Batavia:	
J. T. Johnstone & Co., Inc.	206,320
Raw Products Co.	2,219
By the *Protesilaus*=Ceylon:	
J. T. Johnstone & Co., Inc.	60,491
By the *Rondo*=Batavia:	
J. T. Johnstone & Co., Inc.	9,299
By the *Roepat*=Batavia:	
J. T. Johnstone & Co., Inc.	44,923
By the *Viendijk*=Batavia:	
J. T. Johnstone & Co., Inc.	33,606
By the *Kwanto Maru*=Ceylon:	
J. T. Johnstone & Co., Inc.	58,940
Raw Products Co.	4,480
By the *Shinyo Maru*=Ceylon:	
J. T. Johnstone & Co., Inc.	89,600
By the *Katori Maru*=Ceylon:	
J. T. Johnstone & Co., Inc.	15,680
By the *Siberia Maru*=East:	
Rubber Trading Co.	22,400
J. T. Johnstone & Co., Inc.	32,483
By the *Korea Maru*=East:	
Raw Products Co.	6,720

AFRICANS.

	Pounds.
JULY 23.—By the *Carmania*=Liverpool:	
Rubber Trading Co.	4,480
JUNE 27.—By the *Andania*=Liverpool:	
Rubber Trading Co.	11,200
JULY 9.—By the *Tapajos*=Para:	
Hagemeyer Trading Co. (Negroheads)	22,750

BALATA.

	Pounds.
JULY 17.—By the *Prinsder Nederlanden*=Paramaribo:	
Muller, Schall & Co. (Seramby sheet)	30,071

GUAYULE.

	Pounds.
JUNE 19.—By *El Rio*=Galveston:	
Continental-Mexican Rubber Co.	105,340
JUNE 26.—By *El Mundo*=Galveston:	
Continental-Mexican Rubber Co.	53,400
JUNE 27.—By *El Siglo*=Galveston:	
Continental-Mexican Rubber Co.	55,087
JULY 4.—By the *Neuces*=Galveston:	
Continental-Mexican Rubber Co.	36,091
JULY 4.—By *El Oriente*=Galveston:	
Continental-Mexican Rubber Co.	53,520

CENTRAL SCRAP.

	Pounds.
JUNE 21.—By the *Creole*=New Orleans:	
Muller, Schall & Co. (Mexican)	402

SCRAP.

	Pounds.
JUNE 21.— By the *Santa Marta*=Port Limon:	
Muller, Schall & Co. (Costa Rican)	1,537
JULY 9.—By the *Turrialba*=Port Limon:	
Muller, Schall & Co. (Costa Rican)	1,320

CRUDE RUBBER ARRIVALS AT SEATTLE.

PLANTATIONS.

TO SEATTLE, WASH.

		Pounds.
JUNE 22.—By the *Tamba Maru*=Yokohama:		
L. Littlejohn & Co.	282,690	
Mitsui & Co.	39,555	
W. R. Grace & Co.	8,505	
Robinson & Co.	16,875	347,625
JULY 5.—By the *Sado Maru*=Yokohama:		
W. R. Grace & Co.	8,100	
Mitsui & Co., Limited	2,295	10,395
JULY 9.—By the *Kamakura Maru*=Yokohama:		
L. Littlejohn & Co.	32,805	
Mitsui & Co., Limited	56,700	89,505
JULY 11.—By the *Nippon*=Moji:		
Aldens' Successors, Limited	27,000	
The Raw Products Co.	24,840	
W. R. Grace & Co.	15,120	
L. Littlejohn & Co.	27,540	
Arnold & Zeiss	20,250	114,750
JULY 14.—By the *Shinsei Maru*=Singapore		
Raw Products Co.	11,340	
The B. F. Goodrich Co.	818,370	
Henderson & Korn	27,540	
W. R. Grace & Co.	9,585	
Arthur Meyer & Co.	18,090	
Arnold & Zeiss	30,240	
East Asiatic Co.	9,180	
L. Littlejohn & Co.	35,640	
Robinson & Co.	7,155	967,140
JULY 17.—By the *Inaho Maru*=Kobe:		
Mitsui & Co.		81,810
JULY 22.—By the *Mexico Maru*=Yokohama:		
Arnold & Zeiss		45,090
Meyer & Brown		3,375
Robinson & Co.		32,400
L. Littlejohn & Co., Inc.		36,585
JULY 22.—By the *Shidzuoka Maru*=Yokohama:		
Meyer, New York		1,755

TO AKRON, OHIO.

JULY 5.—By the *Sado Maru*=Yokohama:		
The Goodyear Tire & Rubber Co.		76,410
JULY 6.—By the *Chicago Maru*=Yokohama:		
J. T. Johnstone & Co.	4,860	
The Goodyear Tire & Rubber Co	9,450	14,310
JULY 11.—By the *Nippon*=Moji:		
Rubber Trading Co.	4,860	
J. T. Johnstone & Co.	6,480	
The Goodyear Tire & Rubber Co.	163,890	
Fred Stern & Co.	2,430	177,660
JULY 14.—By the *Shinsei Maru*=Singapore:		
The Firestone Tire & Rubber Co.	391,905	
The Goodyear Tire & Rubber Co.	93,825	495,730
Via Vancouver.		
Meyer & Brown	66,230	
The Goodyear Tire & Rubber Co.	1,081,080	1,147,310
JULY 22.—By the *Mexico Maru*=Yokohama:		
The B. F. Goodrich Co.		272,700
J. T. Johnstone & Co.		38,880
The Goodyear Tire & Rubber Co.		76,815

TO NEW YORK.

JUNE 19.—By the *Louise Nielsen*=East:		
Aldens' Successors, Ltd.		193,000
JUNE 21.—By the *Manila Maru*=East:		
Aldens' Successors, Ltd.		5,000
JULY 5.—By the *Sado Maru*=Yokohama:		
Charles T. Wilson Co., Inc.	2,970	
J. T. Johnstone & Co.	10,800	
W. R. Grace & Co.	51,435	
East Asiatic Co.	13,905	
Arthur Meyer & Co.	3,105	82,215
JULY 6.—By the *Chicago Maru*=Yokohama:		
L. Littlejohn & Co.	2,835	
Arthur Meyer & Co.	4,455	7,290
JULY 9.—By the *Kamakura Maru*=Yokohama:		
Rubber Trading Co.	17,280	
Arthur Meyer & Co.	2,700	
Robinson & Co.	2,025	
L. Littlejohn & Co.	8,100	30,105
JULY 11.—By the *Nippon*=Moji:		
Henderson & Korn	394,470	
J. T. Johnstone & Co.	102,195	
Charles T. Wilson Co., Inc.	206,010	
Robert Badenhop & Co., Inc.	215,190	
Robinson & Co.	72,765	
Winter & Sons	67,635	
Arthur Meyer & Co.	20,385	
Fred Stern & Co.	24,705	
Balfour Williamson & Co.	18,225	
Rubber Trading Co.	3,240	
Aldens' Successors, Ltd.	7,965	
L. Littlejohn & Co.	75,195	
William H. Stiles	57,105	1,265,085
JULY 14.—By the *Shinsei Maru*=Singapore:		
Rubber Trading Co.	8,910	
Aldens' Successors, Ltd.	5,940	
Charles T. Wilson Co., Inc.	32,400	
L. Littlejohn & Co.	143,100	
Edward Maurer Co., Inc.	34,020	
William H. Stiles	21,195	
Hadden & Co.	159,435	
Frank B. Ross Co.	41,985	
East Asiatic Co.	4,860	451,845
Via Vancouver.		
United States Rubber Co.	1,141,695	
Robinson & Co.	37,800	
Meyer & Brown	25,110	1,204,605
JULY 3.—By the *Euryades*=Colombo:		
E. G. Curry	10,800	
Arnold & Zeiss	14,985	25,785
By the *Taisha Maru*=East.		
Aldens' Successors		13,500

TO WATERTOWN, MASS.

JULY 11.—By the *Nippon*=Moji:		
The Hood Rubber Co.		47,250
JULY 14.—By the *Shinsei Maru*=Singapore:		
The Hood Rubber Co.		55,080

TO SAN FRANCISCO, CAL.

JULY 5.—By the *Sado Maru*=Yokohama:		
Mitsui & Co., Ltd.		8,505
JULY 22.—By the *Mexico Maru*=Yokohama:		
Charles T. Wilson Co., Inc.		1,215
Aldens' Successors		3,510
Fred Stern & Co.		6,480
JUNE 20.—By the *Kwanto Maru*=East:		
Aldens' Successors, Ltd.		18,000

TO MONTREAL, CANADA.

JULY 14.—By the *Shinsei Maru*=Singapore:		
Canadian Consolidated Rubber Co.		163,620
By the *Milwaukee*=London.		
Meyer & Brown		15,700

TO TORONTO, CANADA.

JULY 14.—By the *Shinsei Maru*=Singapore:		
J. T. Johnstone & Co.		25,245

TO VANCOUVER.

JULY 14.—By the *Shinsei Maru*=Singapore:		
F. H. Clendenning		16,740

CRUDE RUBBER ARRIVALS AT CLEVELAND.

PLANTATIONS.

TO AKRON, OHIO.

JUNE 30.—By the *Monteagle*=Colombo:		
The Goodyear Tire & Rubber Co.		46,750

PONTIANAK.

TO SEATTLE, WASH.

		Pounds.
JULY 5.—By the *Sado Maru*=Yokohama:		
L. Littlejohn & Co. (Gutta)		15,930
JULY 11.—By the *Nippon*=Moji:		
L. Littlejohn & Co. (Jelutong)	353,295	
L. Littlejohn & Co. (Gutta)	185,760	539,055
JULY 14.—By the *Shinsei Maru*=Singapore:		
L. Littlejohn & Co. (Gutta)	59,400	
L. Littlejohn & Co. (Jelutong)	112,320	
British Bank of South America (Jelutong)	104,125	275,845

TO NEW YORK.

JULY 11.—By the *Nippon*=Moji:		
Equitable Trust Co.		48,465
JULY 14.—By the *Shinsei Maru*=Singapore:		
L. Littlejohn & Co. (Gutta)		30,105

AT PACIFIC COAST.

JULY 21.—By the *Ceylon Maru*=East:		
Meyer & Brown		2,240
JULY 23.—By the *Mexico Maru*=East:		
Meyer & Brown		4,480
JULY 23.—By the *Unkai Maru*=East:		
Meyer & Brown		201,600
By the *Tjisondari*=East:		
Meyer & Brown		33,600
By the *Tjinanock*=East:		
Meyer & Brown		4,480
By the *Siberia Maru*=East:		
Meyer & Brown		11,200

TO NEW YORK.

JULY 9.—By the *Bawean*=Java and Batavia:		
Hagemeyer Trading Co.		190,400

CRUDE RUBBER ARRIVALS AT SAN FRANCISCO.

PLANTATIONS.

JUNE 25.—By the *Madioen*=Sourabaya:		
Firestone Tire & Rubber Co.	390,420	
The B. F. Goodrich Co.	368,280	
Henderson & Korn	39,690	
Hagemeyer Trading Co.	54,540	
L. Littlejohn & Co.	125,145	
Edgar & Co.	68,175	
E. S. Kuh & Valk Co.	84,645	
Arnold & Zeiss	6,885	
The Goodyear Tire & Rubber Co.	18,225	
Edward Maurer & Co.	77,490	
Winter & Sons	42,390	1,275,885
JUNE 29.—By the *Soerakarta*=Rotterdam:		
The Firestone Tire & Rubber Co.	154,170	
The B. F. Goodrich Co.	203,445	
H. B. M. Consul General	40,770	
Edward Maurer & Co.	170,910	
Edgar & Co.	22,140	
H. Peabody	41,850	
E. S. Kuh & Valk Co.	25,245	
L. Littlejohn & Co.	106,785	765,315
JULY 19.—By the *China*=Hong Kong:		
Obalski & Sweeny	8,775	
United States Rubber Co.	210,060	
Charles T. Wilson Co.	81,810	
Arnold & Zeiss	6,885	
L. Littlejohn & Co.	130,545	
Edward Maurer & Co.	27,540	
William H. Stiles Co.	36,855	502,470
JULY 16.—By the *Tjisondari*=Batavia:		
Firestone Tire & Rubber Co.	174,420	
J. T. Johnstone & Co.	49,140	
Edward Maurer & Co.	238,950	
Arnold & Zeiss	141,210	
Meyer & Brown	27,270	
Edgar & Co.	9,045	
H. B. M. Consul General	46,575	
Henry W. Peabody & Co.	7,695	
The Goodyear Tire & Rubber Co.	721,980	1,416,285

JULY 19.—By the *Ecuador*=Singapore:

	Pounds.	
General Rubber Co.	135	
The International Trading Co.	51,975	
Wilson, Holgate & Co.	44,955	
W. T. Basley	945	
East Asiatic Co.	135,675	
Katz Bros.	20,655	
The Goodyear Tire & Rubber Co.	89,235	
W. R. Grace & Co.	10,665	354,240

JULY 23.—By the *Unkai Maru No. 2*=Colombo:

Henderson & Korn	25,110	
Charles T. Wilson Co., Inc.	26,730	
W. R. Grace & Co.	9,180	
Bowers Rubber Works	10,395	
Arnold & Zeiss	27,945	
E. Maurer & Co.	17,415	
Arthur Meyer & Co.	17,820	
Meyer & Brown	160,650	
Guaranty Trust Co.	649,350	
Goodyear Tire & Rubber Co.	50,220	994,815

PONTIANAK.

JUNE 25.—By the *Madioen*=Sourabaya:

L. Littlejohn & Co. (Gutta)	114,480	
United Malaysian Co. (Gutta Siak)	118,800	233,280

JUNE 29.—By the *Soerakarta*=Rotterdam:

Goldman, Sachs & Co.	22,950	
L. Littlejohn & Co.	51,435	74,385

JULY 19.—By the *China*=Hongkong:

Charles Demarest & Co. (Gutta Siak)	6,075

JULY 23.—By the *Unkai Maru No. 2*=Colombo:

Bowers Rubber Works (Gutta)	21,000

CUSTOM HOUSE STATISTICS.

PORT OF BOSTON, MASS.—JUNE, 1917.

IMPORTS:	Pounds.	Value.
India rubber	197,736	$117,182
Rubber scrap	702	56
Manufactures of india rubber	.....	4,390
Totals	198,438	$121,628
EXPORTS:		
Rubber boots .....*pairs*	10,484	$21,315
Rubber shoes .....*pairs*	23,333	39,771
Automobile tires	.....	2,333
Other rubber tires	.....	87
Belting, hose, etc	.....	1,506
All other manufactures of india rubber	.....	4,280
Totals	33,817	$69,292

PORT OF CHICAGO, ILLINOIS—JUNE, 1917.

IMPORTS:	Pounds.	Value.
Rubber scrap	202,502	$14,593
Manufactures of india rubber	.....	527
Totals	202,502	$15,120

PORT OF CLEVELAND, OHIO—JUNE, 1917.

IMPORTS:	Pounds.	Value.
India rubber	128,513	$141,800
Rubber scrap	118	9
Manufactures of india rubber	.....	8,616
Totals	128,631	$150,425

PORT OF GALVESTON, TEXAS—JUNE, 1917.

No transactions.

PORT OF NEW ORLEANS, LOUISIANA—MAY, 1917.

IMPORTS:	Pounds.	Value.
India rubber	36,656	$15,275

PORT OF NEW ORLEANS, LOUISIANA—JUNE, 1917.

IMPORTS:	Pounds.	Value.
India rubber	26,229	$10,990

PORT OF SAN FRANCISCO, CALIFORNIA—MAY, 1917.

IMPORTS:	Pounds.	Value.
India rubber	7,975,826	$5,205,925
Rubber scrap	75,596	2,536
Gutta jelutong	128,727	10,852
Totals	8,180,149	$5,219,313
EXPORTS:		
India rubber boots.....*pairs*	25	$103
India rubber shoes.....*pairs*	8,334	5,518
Automobile tires	.....	115,429
Other rubber tires	.....	8,150
Belting, hose, etc	.....	39,235
All other manufactures of india rubber	.....	20,902
Totals	.....	$189,337

PORTS OF SEATTLE AND TACOMA, WASHINGTON—MAY, 1917.

IMPORTS:	Pounds.	Value.
India rubber	4,373,832	$2,665,450
Gutta jelutong (Pontianak)	216,564	8,259
Manufactures of india rubber	.....	102
Gutta Siak	84,216	8,562
Totals	4,674,612	$2,682,373
EXPORTS:		
India rubber boots.....*pairs*	112	$475
India rubber shoes.....*pairs*	1,755	1,067
Automobile tires	.....	12,119
Other rubber tires	.....	133
Belting, hose, etc	.....	3,101
All other manufactures of india rubber	.....	4,457
Total	.....	$21,352

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—*free:*	April, 1917. Pounds.	Value.
India rubber:		
From—		
France	33,026	$19,195
Portugal	474,637	203,657
United Kingdom	7,950,380	5,771,599
Central American States and British Honduras	107,347	51,168
Mexico	116,127	53,131
Brazil	5,590,783	2,663,719
Other South America	1,168,704	550,694
East Indies	18,697,068	10,889,769
Other countries	598,193	368,705
Totals	34,736,265	$20,571,637
Balata	412,467	$211,259
Guayule gum	328,545	80,511
*Gutta jelutong	862,933	38,432
Gutta percha	328,735	144,993
Totals	36,668,945	$21,046,832
Rubber scrap	1,661,744	169,428
Totals unmanufactured	38,330,689	$21,216,260
Chicle .....*dutiable*	596,127	$301,384
MANUFACTURED—*dutiable:*		
Gutta percha	.....	$10,181
India rubber	.....	78,423
Totals, manufactured	.....	$88,604
Substitutes—elasticon, etc	.....	$18,822

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	April, 1917. Pounds.	Value.
Automobile tires:		
To—		
France	.....	$88,396
Russia in Europe	.....	2,254
England	.....	124,895
Canada	.....	106,704
Mexico	.....	31,642
Cuba	.....	85,683
Australia	.....	69,888
New Zealand	.....	128,824
Philippine Islands	.....	5,991
Other countries	.....	622,737
Total	.....	$1,267,014
All other tires	.....	$128,336
Belting, hose and packing	.....	284,329
Rubber boots.....*pairs*	37,935	87,777
Rubber shoes.....*pairs*	164,047	85,999
Scrap and old rubber	529,677	45,536
Reclaimed rubber	709,663	110,551
Other rubber manufactures	.....	707,307
Totals, manufactured	.....	$2,716,849
Fountain pens.....*number*	13,943	$10,782

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	April, 1917. Pounds.	Value.
Balata	78,359	$48,462
Guayule gum	.....	.....
Gutta jelutong	.....	.....
Gutta percha	.....	.....
India rubber	756,302	460,667
Rubber scrap and refuse	626	135
Totals, unmanufactured	835,287	$509,264
Chicle	128	$51

MANUFACTURED—	April, 1917. Pounds.	Value.
India rubber	.....	$4,567
Substitutes—elasticon, etc.	.....	26

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

MANUFACTURED:	April, 1917. Pounds.	Value.
To—		
Alaska:		
Belting, hose and packing	.....	$29,656
Boots and shoes.....*pairs*	13,066	34,401
Other rubber goods	.....	4,096
Totals	13,066	$68,153
To—		
Hawaii:		
Belting, hose and packing	.....	$6,899
Automobile tires	.....	55,334
Other tires	.....	8,358
Other rubber goods	.....	13,356
Total	.....	$83,947
To—		
Philippine Islands:		
Belting, hose and packing	.....	$3,865
Boots and shoes.....*pairs*	12,914	9,700
Tires	.....	8,965
Other rubber goods	.....	3,337
Totals	12,914	$25,867
To—		
Porto Rico:		
Belting, hose and packing	.....	$2,954
Automobile tires	.....	37,323
Other tires	.....	965
Other rubber goods	.....	3,597
Total	.....	$44,839

* Dutiable beginning July 1, 1916.

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	February, 1917. Pounds.	Value.
India rubber and gutta percha —raw and reclaimed:		
From—		
Great Britain	106,920	.....
African French Colony	12,540	.....
Belgian Congo	119,900	.....
Brazil	603,460	.....
Other countries	310,660	.....
Totals	1,153,460	4,194,400
Rubber scrap	105,380	43,110
MANUFACTURED—		
India rubber and gutta percha —threads:		
From—		
Great Britain	3,740	.....
Other countries	220	.....
Totals	3,960	36,000
India rubber and gutta percha —sheets:		
Cut sheets	220	.....
Hard rubber	4,840	.....
Totals	5,060	17,600
India rubber and gutta percha —tubes:		
From cut sheet	220	1,800
Elastic fabrics	4,620	12,600
Other forms	440	1,400
Belting	11,440	36,400
Rubber coated fabrics—*pieces*	9,020	57,400
Other fabrics:		
From—		
Great Britain	4,620	.....
Other countries	2,420	.....
Totals	7,040	32,000
Boots and shoes—*pairs:*		
From—		
France	3,137	.....
United States	1,606	.....
Totals	4,743	23,715

	February, 1917.	
	Pounds.	Lire.
Elastic webbing:		
From—		
France	7,700	.....
Great Britain	1,980	.....
Other countries	1,100	.....
Totals	10,780	73,500
Articles not specified:		
From cut sheets	2,200	20,000
Fabrics:		
From—		
France	3,080	.....
Great Britain	7,040	.....
Other countries	3,740	.....
Totals	13,860	56,700
Tires and tubes:		
From—		
France	63,580	.....
Great Britain	49,500	.....
Other countries	1,100	.....
Totals	114,180	1,038,000
Other rubber manufactures:		
From—		
France	10,340	.....
Great Britain	42,680	.....
United States	16,720	.....
Other countries	220	.....
Totals	69,960	254,400
Total Imports	.....	5,900,725

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

	February, 1917.	
UNMANUFACTURED—	Pounds.	Lire.
India rubber and gutta percha —raw and reclaimed:		
To—		
Spain	72,600	.....
United States	159,060	.....
Totals	231,660	421,200
MANUFACTURED—		
India rubber and gutta percha threads:		
To—		
France	3,300	.....
Great Britain	3,080	.....
Spain	2,200	.....
Switzerland	3,520	.....
Argentina	2,640	.....
Other countries	440	.....
Totals	15,180	138,000
India rubber and gutta percha —sheets:		
Cut sheets	660	5,100
Elastic fabric	880	1,800
Insulated wire	220	300
Hard rubber	1,320	4,800
India rubber and gutta percha —tubes:		
Elastic fabrics	9,020	24,600
Other forms	9,680	30,800
Rubber coated fabrics..*pieces*	14,300	55,250

	February, 1917.	
	Pounds.	Lire.
Elastic webbing:		
To—		
France	1,320	.....
Greece	1,100	.....
Spain	3,080	.....
Switzerland	21,780	.....
Egypt	3,960	.....
Argentina	11,220	.....
Brazil	25,960	.....
Chili	2,860	.....
Cuba	4,400	.....
Other countries	5,940	.....
Totals	81,620	556,500
Clothing and articles for travel	4,180	43,700
Articles not specified:		
From cut sheets:		
To—		
Great Britain	660	.....
Argentina	2,200	.....
Totals	2,860	26,000
Fabrics	4,400	18,000
Tires and tubes:		
To—		
France	160,820	.....
Great Britain	487,080	.....
Switzerland	1,100	.....
India and Ceylon	84,700	.....
Argentina	130,460	.....
Brazil	23,980	.....
Other countries	206,360	.....
Totals	1,094,500	9,950,000
Other rubber manufactures:		
To—		
France	11,660	.....
Great Britain	9,020	.....
Spain	2,420	.....
Switzerland	9,240	.....
Egypt	440	.....
Argentina	20,240	.....
Brazil	7,260	.....
Uruguay	3,520	.....
Other countries	5,280	.....
Totals	69,080	251,200
Total Exports	.....	11,527,250

The nominal value of a lira is $0.193.

UNITED KINGDOM RUBBER STATISTICS.

The import and export figures by countries usually published in this table are withheld by the British Government.

IMPORTS.

	May, 1917.	
UNMANUFACTURED—	Pounds.	£ Sterling.
Crude rubber	16,104,900	2,320,365
Waste and reclaimed rubber.	508,200	14,364
Gutta percha	343,280	42,574
Totals	16,956,380	2,377,303
MANUFACTURED—		
Boots and shoes...*doz. pairs*	4,883	12,521
Insulated wire	.....	1,603
Automobile tires and tubes..	.....	152,473
Motorcycle tires and tubes..	.....	9,791
Cycle tires and tubes	.....	28,416
Tires not specified	.....	125
Total	.....	204,929

EXPORTS.

	May, 1917.	
UNMANUFACTURED—	Pounds.	£ Sterling.
Waste and reclaimed rubber.	1,257,400	21,763
MANUFACTURED—		
Apparel, waterproofed	.....	52,621
Boots and shoes...*doz. pairs*	6,482	7,517
Insulated wire	.....	9,158
Submarine cables	.....	3,322
Automobile tires and tubes..	.....	113,434
Motorcycle tires and tubes..	.....	5,730
Cycle tires and tubes	.....	26,404
Tires not specified	.....	11,605
Manufactures not specified..	.....	148,907
Total	.....	378,698

EXPORTS—FOREIGN AND COLONIAL.

	May, 1917.	
UNMANUFACTURED—	Pounds.	£ Sterling.
Crude rubber	13,996,800	2,189,925
Waste and reclaimed rubber.	87,900	3,257
Gutta percha	20,048	2,265
Totals	14,104,748	2,195,447
MANUFACTURED—		
Boots and shoes...*doz. pairs*	3,462	4,948
Insulated wire	.....	6,998
Automobile tires and tubes..	.....	79,414
Motorcycle tires and tubes..	.....	347
Total	.....	91,707

The value of £ Sterling is $4.76.

LONDON AND LIVERPOOL RUBBER STATISTICS.

The import and export figures by countries usually published in this table are withheld by the British Government.

IMPORTS.

	May, 1917.	
UNMANUFACTURED—	Pounds.	£ Sterling.
Crude rubber:		
At—		
London	11,366,100	1,707,982
Liverpool	3,620,500	489,377
Totals	14,986,600	2,197,359
Waste and reclaimed rubber:		
At—		
London	22,800	557
Liverpool	120,800	2,546
Totals	143,600	3,103

EXPORTS.

Waste and reclaimed rubber manufactures of the United Kingdom:		
From—		
London	621,500	7,382
Liverpool	282,600	7,565
Totals	904,100	14,947

RE-EXPORTS.

Crude rubber:		
From—		
London	11,081,600	1,783,151
Liverpool	2,577,900	367,600
Totals	13,659,500	2,150,751
Waste and reclaimed rubber:		
From—		
London	4,500	155
Liverpool	60,700	1,882
Totals	65,200	2,037

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING MAY, 1917.

	NEW YORK.					EUROPE.					
EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	Total.	Fine.	Medium.	Coarse.	Caucho.	Total.	Grand Totals.
Stowell & Co	91,399	13,739	95,706	224,164	425,008	73,691	4,213	1,137	.....	99,041	524,049
General Rubber Co	296,288	29,703	101,842	240,807	668,640	.....	.....	.....	.....	.....	668,640
Suarez Hermanos & Co., Limited.	105,063	536	39,165	94,457	239,221	36,245	.....	9,861	43,167	89,273	328,494
J. Marques	47,811	14,605	66,702	71,537	200,655	36,230	.....	.....	.....	36,230	236,885
Pires Peixeira & Co	79,281	8,370	56,557	58,086	202,294	16,980	.....	.....	.....	16,980	219,274
G. Fradelizi & Co	66,280	6,739	83,952	58,374	215,345	.....	.....	.....	.....	.....	215,345
Chamié & Co	14,450	.....	40,440	101,400	156,290	.....	.....	.....	.....	.....	156,290
Berringer & Co	77,392	4,735	10,186	50,332	142,645	.....	.....	.....	.....	.....	142,645
Bitar Irmãos	9,440	3,040	1,050	79,050	92,580	.....	.....	.....	10,500	10,500	103,080
Adelbert H. Alden, Limited	11,050	4,951	23,356	.....	39,357	30,260	.....	.....	6,458	36,718	76,075
Seligmann & Co	11,971	.....	1,310	53,442	66,723	.....	.....	.....	.....	.....	66,723
Sundries	26,517	1,940	25,593	33,525	87,575	43,287	2,308	1,303	2,002	48,900	136,475
	836,942	88,358	545,859	1,065,174	2,536,333	256,693	6,521	12,301	62,127	337,642	2,873,975
From Manãos	269,588	57,144	159,043	532,196	1,017,971	142,904	67,399	5,934	139,579	355,816	1,373,787
Totals	1,106,530	145,502	704,902	1,597,370	3,554,304	399,597	73,920	18,235	201,706	693,458	4,247,762

Compiled by Stowell & Co.

EXPORTS OF INDIA RUBBER FROM MANAOS DURING JUNE, 1917.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTALS.
Stowell & Co.....*kilos*	21,600	1,997	4,084	48,120	75,801	.....	.....	.....	.....	.....	75,801
General Rubber Co. of Brazil....	15,991	3,200	6,119	24,690	50,000	34,720	37,200	99	74,981	147,000	197,000
H. Balding	.....	.....	.....	.....	.....	39,008	3,625	963	.....	43,596	43,596
J. G. Araujo.....	958	68	4,722	160	5,908	24,052	4,510	5,451	2,579	36,592	42,500
G. Fradelizi	.....	.....	3,812	19,778	23,590	.....	16,651	.....	.....	16,651	40,241
Tancredo Porto & Co.....	4,480	.....	6,269	2,113	12,862	3,743	5,779	.....	57	9,579	22,441
Adelbert H. Alden, Ltd.....	.....	3,570	1,950	9,920	15,440	2,691	20	44	1,186	3,941	19,381
Mesquita & Co.....	.....	.....	.....	.....	.....	294	800	1,890	40	3,024	3,024
Ohliger & Co.....	146	25	221	1,207	1,599	.....	.....	.....	.....	.....	1,599
W. Peters	.....	.....	120	600	720	.....	.....	.....	.....	.....	720
Totals, Manaos	43,175	8,860	27,297	106,588	185,920	104,508	68,585	8,447	78,843	260,383	446,303
In transit, Iquitos.....	.....	.....	599	2,644	3,243	.....	.....	.....	.....	.....	3,243
Totals	43,175	8,860	27,896	109,232	189,163	104,508	68,585	8,447	78,843	260,383	449,546

EXPORTS OF INDIA RUBBER FROM MANAOS FROM JANUARY TO JUNE, 1917.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Fine.	EUROPE. Medium.	Coarse.	Caucho.	TOTAL.	TOTAL.	GRAND TOTALS.
Stowell & Co.....*kilos*	235,028	19,201	142,126	592,824	989,179	347,331	41,852	7,537	75,236	471,956	1,461,135
General Rubber Co. of Brazil....	541,554	80,126	270,248	761,072	1,653,000	554,752	143,401	16,972	325,935	1,041,000	2,694,000
Tancredo Porto & Co.....	655,715	137,999	291,885	251,063	1,336,662	390,767	49,139	2,116	110,557	552,579	1,889,241
J. G. Araujo.....	364,155	34,522	194,850	13,252	606,779	248,174	24,807	27,704	98,289	398,974	1,005,753
Adelbert H. Alden, Ltd.....	26,011	58,673	95,892	74,739	255,315	433,370	1,844	2,432	169,482	607,128	862,443
Ohliger & Co.....	289,148	19,493	78,287	157,849	544,777	.....	.....	.....	.....	.....	544,777
H. Balding	20,985	.....	.....	.....	20,985	103,168	8,238	3,240	27,718	142,364	163,349
G. Fradelizi	.....	6,649	4,118	80,746	91,513	21,120	16,651	.....	.....	37,771	129,284
Madeira Mamoré Railway.....	839	97	152	48,939	50,026	.....	.....	.....	.....	.....	50,026
J. L. Traqueia.....	22,596	1,749	8,354	1,200	33,899	.....	.....	.....	.....	.....	33,899
G. Fradelizi & Co.....	22,418	10,768	.....	.....	33,186	.....	.....	.....	.....	.....	33,186
Gunzburger & Co.....	16,807	1,473	7,913	5,876	32,069	.....	.....	.....	.....	.....	32,069
W. Peters	7,820	450	8,880	11,615	28,765	.....	.....	.....	.....	.....	28,765
H. Semper	7,792	2,425	11,504	4,573	26,294	.....	.....	.....	.....	.....	26,294
A. F. de Souza & Co.....	14,188	.....	2,818	5,161	22,167	.....	.....	.....	.....	.....	22,167
S. A. Armazens Andresen.....	17,095	.....	.....	.....	17,095	.....	.....	.....	.....	.....	17,095
Thomas Levy Camille & Co.....	.....	.....	.....	.....	.....	5,067	466	4,907	730	11,170	11,170
Semper & Co.....	8,160	800	990	.....	9,950	.....	.....	.....	.....	.....	9,950
B. Levy & Co.....	.....	.....	.....	.....	.....	7,626	932	610	300	9,468	9,468
Moraes, Carneiro & Co.....	.....	.....	.....	.....	.....	2,617	1,677	1,014	2,352	7,660	7,660
H. Pralow	2,082	66	4,028	1,197	7,373	.....	.....	.....	.....	.....	7,373
Mesquita & Co.....	160	.....	.....	.....	160	614	1,211	3,149	220	5,194	5,354
Amorim Irmaõs	1,100	140	3,740	.....	4,980	.....	.....	.....	.....	.....	4,980
Vianna Andrade & Co.....	.....	.....	.....	130	130	.....	.....	.....	.....	.....	130
Totals Manaos	2,253,653	374,631	1,125,785	2,010,235	5,764,304	2,114,606	290,218	69,621	810,819	3,285,264	9,049,568
In transit, Iquitos.....	158,713	12,288	80,729	187,645	439,375	87,481	10,936	36,833	156,639	291,889	731,264
Totals	2,412,366	386,919	1,206,514	2,197,880	6,203,679	2,202,087	301,154	106,454	967,458	3,577,153	9,780,832

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING JUNE, 1917.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTALS.
Stowell & Co.....*kilos*	13,684	3,136	16,609	22,088	55,517	35,994	5,087	4,660	23,499	69,240	124,757
J. Marques	57,639	6,004	58,786	48,662	171,091	23,479	.....	.....	30,051	53,530	224,621
Suarez Hermanos & Co., Ltd.....	90,298	.....	13,631	36,440	140,369	.....	.....	.....	15,026	15,026	155,395
Pires Teixeira & Co.....	47,086	4,041	26,597	18,437	96,161	.....	.....	.....	.....	.....	96,161
Chamié & Co.....	16,980	.....	23,010	41,550	81,540	.....	.....	.....	5,100	5,100	86,640
General Rubber Co.....	25,579	2,405	10,245	32,173	70,402	10,200	.....	.....	.....	10,200	80,602
Bitar Irmãos	2,400	640	1,120	66,150	70,310	982	134	658	312	2,086	72,396
Adelbert H. Alden, Ltd.....	19,550	1,020	8,430	900	29,900	850	.....	.....	300	1,150	31,050
Seligmann & Co.....	23,378	.....	2,705	2,874	28,957	.....	.....	.....	.....	.....	28,957
G. Fradelizi & Co.....	15,514	1,770	6,985	2,439	26,708	.....	.....	.....	.....	.....	26,708
Sundries	5,347	170	3,098	26,396	35,011	5,868	640	94	312	6,914	41,925
	317,455	19,186	171,216	298,109	805,966	77,373	5,861	5,412	74,600	163,246	969,212
From Manaos	271,185	22,326	142,632	314,624	750,767	104,508	68,585	8,504	78,786	260,383	1,011,150
Totals	588,640	41,512	313,848	612,733	1,556,733	181,881	74,446	13,916	153,386	423,629	1,980,362

EXPORTS OF INDIA RUBBER FROM PARA FROM JANUARY TO JUNE, 1917.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	TOTAL.	GRAND TOTALS.
Stowell & Co.....*kilos*	613,664	78,670	459,506	531,035	1,682,875	763,463	52,108	20,083	62,007	897,661	2,580,536
J. Marques	277,352	106,036	523,216	217,180	1,123,784	963,762	53,771	99,760	322,374	1,439,667	2,563,451
General Rubber Co.....	848,554	69,654	558,408	491,855	1,968,471	124,082	11,858	5,676	805	142,421	2,110,892
Suarez Hermanos & Co., Ltd.....	654,058	536	67,876	194,961	917,431	118,688	.....	38,836	166,158	323,682	1,241,113
Pires Teixeira & Co.....	445,444	51,982	346,229	199,892	1,043,547	64,915	.....	.....	551	65,466	1,109,013
G. Fradelizi & Co.....	170,346	26,893	215,554	120,073	532,866	120,243	2,583	.....	10,350	133,176	666,042
Adelbert H. Alden, Ltd.....	62,537	27,568	99,641	20,927	210,673	354,334	.....	.....	9,717	364,051	574,724
Berringer & Co.....	258,708	23,331	70,870	107,109	460,018	.....	.....	.....	.....	.....	460,018
Chamie & Co.....	40,583	97	116,138	255,646	412,464	.....	.....	.....	5,100	5,100	417,564
Bitar Irmãos	15,360	5,600	2,770	187,650	211,380	982	134	658	10,812	12,586	223,966
Seligmann & Co.....	79,457	16	15,275	107,645	202,393	.....	.....	.....	.....	.....	202,393
Sundries	129,622	4,794	193,293	213,435	541,144	88,603	10,501	5,862	40,584	145,550	686,694
Totals, Para	3,595,685	395,177	2,668,776	2,647,408	9,307,046	2,599,072	130,955	170,875	628,458	3,529,360	12,836,406
From Itacoatiara	4,250	340	2,700	17,400	24,690	2,160	.....	1,300	2,720	6,180	30,870
From Manãos	2,236,407	386,281	1,150,249	2,007,480	5,780,417	2,114,606	290,218	69,678	810,762	3,285,264	9,065,681
From Iquitos	159,302	12,288	73,215	155,954	400,759	87,481	10,936	36,833	156,639	291,889	692,648
Totals	5,995,644	794,086	3,894,940	4,828,242	15,512,912	4,803,319	432,109	278,686	1,598,579	7,112,693	22,625,605
From Para to Rio de Janeiro—											
J. Marques	154,507	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Alves Braga & Co.....	200	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	154,707	.....	.....	.....	.....	.....	.....	.....	.....	.....	154,867
From Manaos to Rio de Janeiro—											
Mesquita Co.	160	.....	.....	.....	.....	.....	.....	.....	.....	.....	22,780,472

(Compiled by Stowell & Co., Para and Manaos.)

HOLLAND IMPORTS OF RUBBER.

			Increase or	
Gutta percha, crude: From—	Gulden.	Gulden.		Gulden.
France	31,000	.....	—	31,000
Great Britain	549,000	29,000	—	520,000
Dutch Guiana	744,000	85,000	—	659,000
Java, etc.	709,000	.....	—	709,000
Other countries	113,000	2,000	—	111,000
Totals	2,146,000	116,000	—	2,030,000
Gutta percha manufactures: From—				
Belgium	503,000	2,000	—	501,000
Great Britain	176,000	241,000	+	65,000
Germany	221,000	8,000	—	213,000
Other countries	1,000	31,000	+	30,000
Totals	901,000	282,000	—	619,000
India rubber manufactures: From—				
Belgium	2,417,000	1,000	—	2,416,000
Great Britain	2,271,000	3,010,000	+	739,000
Java	8,520,000	.....	—	8,520,000
Germany	106,000	160,000	+	54,000
United States	12,000	28,000	+	16,000
Other countries	912,000	724,000	—	188,000
Totals	14,238,000	3,923,000	—	10,315,000

One Gulden is equivalent to $0.40 United States Currency. (Converted to United States Currency in table below.)

	Value.		Increase or	
Gutta percha, crude:	1914.	1915.		Decrease.
From—				
France	$12,400	.....	—	$12,400
Great Britain	219,600	$11,600	—	208,000
Dutch Guiana	297,600	34,000	—	263,600
Dutch East Indies	283,600	.....	—	283,600
Other countries	45,200	800	—	44,400
Totals	$858,400	$46,400	—	$812,000
Gutta percha, manufactures: From—				
Belgium	$201,200	$800	—	$200,400
Great Britain	70,400	96,400	+	26,000
Germany	88,400	3,200	—	85,200
Other countries	400	12,400	+	12,000
Totals	$360,400	$112,800	—	$247,600
India rubber manufactures: From—				
Belgium	$966,800	$400	—	$966,400
Great Britain	908,400	1,204,000	+	295,600
Java	3,408,000	.....	—	3,408,000
Germany	42,400	64,000	+	21,600
United States	4,800	11,200	+	6,400
Other countries	364,800	289,600	—	75,200
Totals	$5,695,200	$1,569,200	—	$4,126,000

THE MARKET FOR RUBBER SCRAP.

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NEW YORK.

THE rubber scrap market developed a pronounced weakness during the latter part of June that continued into the first week of the month just passed when all grades shared in the general downward movement. The absence of actual buying during the entire month has failed to support the sagging market and the amount of real business reported was confined to contract deliveries and small lot orders. In spite of the dull market conditions values have been supported in a manner that shows confidence in the future. With crude rubber at unusually low prices the demand for scrap and reclaim will naturally be curtailed, however with the rubber mills busy on war orders and reclaim moving freely there is hope not long deferred for better conditions in the rubber scrap market.

BOOTS AND SHOES. The market for this material has been generally inactive although some transactions have been reported that would indicate at least a passing interest in boots and shoes. Prices for delivered lots are said to be 9½ cents, but reclaimers persist in offering 9⅜ cents. Trimmed arctics have failed in interest at 7⅜ cents and untrimmed are nominal at 6⅜ cents. The hope of the boot and shoe situation is based on the large war orders that the rubber mills are working on to meet government requirements.

TIRES. The tire situation has been affected by the ruling sluggish conditions that are in a measure seasonable and expected in the trade. White G. & G. tires have been shown very little interest, and the mixed tire business transacted during the month has been almost negligible. Prices are ⅛ to ¼ cent lower than our quotations last month. However solid and bicycle tires have experienced a fair demand at firm prices.

INNER TUBES. This material appears to have been entirely neglected with the exception of small lot orders. Inner tubes free from patches and valve seats is a new grade provided for in the new rubber specifications.

MECHANICALS. There has been practically no movement in mechanicals last month, and prices, with few exceptions, have not changed.

LONDON AND LIVERPOOL STATISTICS. The London and Liverpool imports of waste and reclaimed rubber for May were 143,600 pounds, compared to 167,300 pounds for April. Reexports for May were 65,200 against 22,300 for April. Exports of waste and reclaimed rubber manufactures of the United Kingdom for May were 904,100 pounds, against 1,062,300 pounds for April.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

JULY 25, 1917.

Prices subject to change without notice.

	Per Pound.	
Boots and shoes	$0.09½@	
Trimmed arctics	.07⅜@	
Untrimmed arctics	.06⅜@	
White tires, Goodrich and Goodyear	.07¼@	
Auto tires, standard white	.07⅛@	
standard mixed	.07 @	
stripped, unguaranteed	.06 @	
Auto peelings, No. 1	.10 @	
No. 2	.08⅞@	.09
Inner tubes, No. 1	.26 @	.26½
No. 2	.13 @	.13¼
red	.13½@	
Ironv tires	.13¼@	
Bicycle tires	.05⅜@	
Solid tires	.07 @	
Clean truck tires	.08 @	
White scrap, No. 1	.13½@	.14
No. 2	.10 @	
Red scrap, No. 1	.09¾@	.10
No. 2	.07¾@	
Mixed black scrap, No. 1	.05 @	.05⅛
No. 2	.04¼@	.04⅜
Rubber car springs	.05½@	
Horse shoe pads	.05 @	
Matting and packings	.01⅝@	
Garden hose	.02¼@	
Air brake hose	.06 @	
Cotton fire hose	.02⅞@	
Large hose	.02¼@	
Hard rubber scrap, No. 1, bright fracture	.27 @	.28
Battery jars (black compound)	.03½@	.03¼
Insulated wire stripping	.04½@	
Rubber heels	.04 @	.04¼

* Nominal prices.

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

Copyright 1917.

NEW YORK.

JULY has been a dull month in the base metal market, with the uncertainty of the government's final policy as the chief disturbing factor. Should the one-price-to-all plan be adopted, present market values will undoubtedly experience radical changes. Under the present conditions it would be daring to buy except for immediate requirements. The leading producers have temporarily withdrawn from the market. Lead has been generally weak with prices showing a downward tendency, until the last week of the month when the market stiffened somewhat. That the government will soon require large quantities of this metal is firmly believed in trade centers. Spelter has shown weakness and prices have declined during the month, due to the question of government requirements and price regulations. Metal antimony has weakened in the face of small demand and prices have consequently declined. Aluminum has had but little call last month and prices are lower, No. 1 virgin metal, 98 to 99 per cent pure, being quoted 53 to 55 cents on July 25.

Business in rubber materials has been good for the month just passed. The volume of supply, while far from normal, has appeared to equal the demand. The market has not been affected by the periodic summer dullness, but on the contrary, conditions are brisk and buying active. The report that government specifications for inner tubes and airplane hose will include antimony sulphuret and heavy calcined magnesia has strengthened the market for these materials.

ACETONE. A steady demand and increased cost to producers has marked up the price of acetone about 3 cents a pound.

ALUMINUM FLAKE. Business has been good and deliveries on contracts regularly called for. Prices are unchanged and firm.

ANTIMONY SULPURETS. The buying in this material has been quite active, and consumers have been freely anticipating their future requirements. Prices are the same as a month ago and market conditions firm.

CARBON BISULPHIDE. The call has been so insistent that some dealers are entirely sold up. Prices have advanced and 7 to 7½ cents are the present quotations.

CARNAUBA WAX. This has been requisitioned by the British Government, all stocks over two tons have been seized and no further dealings in this material will be permitted without a license.

DRY COLORS. Active demand has featured the color market. Bright red oxide, ultramarine and cobalt blue have received particular attention from consumers. Prices are firm and show an upward tendency.

LEAD PIGMENTS. These have been steady and unchanged by the lower prices of pig lead. Producers are waiting the government's decision as to quantity required and price to be paid.

LITHOPONE. The market has been quiet, with consumers asking for contract deliveries without reserve. Prices are firm but unchanged.

RECLAIMED RUBBER. The call for supplies of this material has been urgent from all quarters, with the question of delivery taking precedence over price. Prospects are good for continued activity in this market for the balance of the year.

WHITING. The market continues strong, due to the fact that producers are entirely sold up. There is no tangible relief in sight and until the difficulties that prevent the arrival of the raw materials are removed there will be no change for the better.

ZINC OXIDE. While the demand for spot zinc oxide has been active, actual trading has been light, due to the high prices asked by holders of second-hand stocks and the reluctance on the part of consumers to pay 16 to 18 cents for spot zinc oxide. Contract deliveries have been regularly called for by the rubber trade.

NEW YORK QUOTATIONS.

JULY 28, 1917.

Subject to change without notice.

Accelerene	lb.	*$2.62	@	
Acetone (drums)	lb.	.33	@	.34
Acid, acetic, 28 per cent. (bbls.)	lb.	.05½	@	.05½
glacial, 99 per cent (carboys)	lb.	.37½	@	.40
cresylic (crude)	gal.	1.00	@	1.10
muriatic, 20 degrees	lb.	.02½	@	
nitric, 36 degrees	lb.	.07	@	
sulphuric, 66 degrees	lb.	.02½	@	
Aldehyde ammonia (crystals)	lb.	1.00	@	
Aluminum flake (carloads, bbls.)	ton	24.00	@	
(carloads, sacks)	ton	22.00	@	
Ammonium carbonate, powdered	lb.	.12½	@	
lumps	lb.	.11½	@	
Antimony, crimson, sulphuret of (casks)	lb.	.45	@	
crimson, "Magmetco"	lb.	*.45	@	
crimson, "Mephisto" (casks)	lb.	.50	@	
golden, sulphuret of (casks)	lb.	.25	@	
golden, "Magmetco"	lb.	*.30	@	
golden, "Mephisto"	lb.	.26	@	
golden, sulphuret, States brand, 16-17 per cent.	lb.	.28	@	
red sulphuret, States brand	lb.	.25	@	
vermilion sulphuret	lb.	.60	@	
Arsenic, red sulphide	lb.	.50	@	
Asbestine (bags)	ton	21.50	@	
Asbestos (bags)	ton	*35.00	@	50.00
Barium sulphate, precipitated	lb.	.04	@	
Baryter, pure white	ton	32.00	@	33.00
off color	ton	22.00	@	23.00
Basofor	ton	80.00	@	
Benzol, pure	gal.	.55	@	.60
90 per cent.	gal.	.55	@	.60
Beta-Naphthol	lb.	.70	@	.75
Brown oxide of iron	lb.	.01½	@	.02
sienna, raw and burnt	lb.	.05	@	.10
umber, raw and burnt	lb.	.04½	@	
ochre, domestic	lb.	.02	@	.03
imported	lb.	.04	@	.04½
Bone ash	lb.	.06	@	
black, powdered	lb.	.05	@	
granular	lb.	*.25	@	
Cadmium tri-sulphate (f. o. b. London)	lb.	*2.68	@	
sulphide, yellow	lb.	*2.25	@	
Cantella gum	lb.	.38	@	
Carbon, bisulphide (drums)	lb.	.06½	@	.07½
black (cases)	lb.	.27	@	.35
tetrachloride (drums)	lb.	.17	@	.18
Caustic soda, 76 per cent.	lb.	.06¾	@	.06½
Chalk, precipitated, extra light	lb.	.05	@	.05½
precipitated, heavy	lb.	.04	@	.04½
China clay, domestic (powdered)	ton	20.00	@	25.00
imported (powdered)	ton	45.00	@	
Chrome, green	lb.	.40	@	
yellow	lb.	.24	@	
Cobalt blue	lb.	.35	@	.50
Cotton linters	lb.	*.07¾	@	
Excellerex	lb.	.85	@	
Fossil flour	ton	60.00	@	65.00
Gas black (cases)	lb.	.27	@	.35
Gilsonite	ton	40.00	@	
Glue, high grade	lb.	.40	@	.60
medium	lb.	.30	@	.40
low grade	lb.	.25	@	.28
Glycerine, C. P. (drums)	lb.	.63	@	
Graphite, flake (400 pound bbl.)	lb.	*.14	@	
amorphous	lb.	*.06	@	
Green oxide of chromium (casks)	lb.	.75	@	
Ground glass FF. (bbls.)	lb.	.02¾	@	
Hexamethylene Tetramine (powdered)	lb.	.65	@	.80
Indian red, reduced grades	lb.	.05	@	.08
pure	lb.	.10	@	
Infusorial earth, powdered	ton	60.00	@	
bolted	ton	65.00	@	
Iron oxide, red, reduced grades	lb.	.04	@	
red, pure, bright	lb.	.12	@	.16
red, excelsior	lb.	*.18	@	
Ivory, black	lb.	.16	@	.30
Lampblack	lb.	.14	@	.20
Lead, red oxide of	lb.	.13	@	
sublimed blue	lb.	.11	@	
sublimed white	lb.	.11	@	.11½
white, basic carbonate	lb.	.11½	@	
white, basic sulphate	lb.	.11	@	
black hyposulphite (Black Hypo)	lb.	*.50	@	
Lime, flour	lb.	.01½	@	.01½
Litharge, domestic	lb.	.11½	@	.12½
English	lb.	.13½	@	.14
sublimed	lb.	.13	@	
Lithopone, imported	lb.	.13	@	.14
domestic	lb.	.06½	@	.06¾
Beckton white (carloads)	lb.	*.06½	@	
Magnesia, carbonate	lb.	.20	@	.22
calcined, heavy, Thistle Brand	lb.	.14	@	
light	lb.	.70	@	.75
Magnesite, calcined, powdered	ton	40.00	@	50.00
Mica, powdered	lb.	.03½	@	.05
Mineral rubber	lb.	.03¾	@	.05
"M. R. X."	ton	100.00	@	
"Genasco" (carloads)	ton	*37.00	@	
"Pioneer"	ton	45.00	@	
"Richmond Brand"	lb.	.03	@	
"No. 64 Brand"	ton	40.00	@	
"Refined Elaterite"	lb.	*.05	@	
Naphtha, stove gasoline (steel bbls.)	gal.	.24	@	
66@68 degrees (steel bbls.)	gal.	.29	@	
68@70 degrees (steel bbls.)	gal.	.30	@	
V. M. & P. (steel bbls.)	gal.	.23	@	
Oil, aniline	lb.	.30	@	
corn, refined (Argo)	cwt.	14.96	@	
linseed (bbl.)	gal.	1.10	@	
palm	lb.	.16	@	.17½

paraffin	gal.	.27	@	.28
pine (cases)	gal.	.48	@	
pine tar	gal.	.28	@	
rapeseed, blown	gal.	1.50	@	1.60
rosin	gal.	.32	@	
tar (cases)	gal.	.27	@	.34
soluble aniline colors, yellow, orange	lb.	*2.50	@	
Orange mineral, domestic	lb.	.15	@	
Paragol, soft and medium (carloads)	cwt.	11.95	@	
hard	cwt.	11.45	@	
Petrolatum	lb.	.05½	@	
Petroleum grease	lb.	.04½	@	.04¾
Pine tar retort	bbl.	15.00	@	
kiln	bbl.	14.00	@	
Pitch, burgundy	lb.	.04¼	@	
coal tar	lb.	.00½	@	
pine tar	lb.	.02	@	
Plaster of paris	bbl.	2.00	@	3.00
Prussian blue	lb.	.70	@	
Pumice stone, powdered (bbls.)	lb.	.03½	@	
Reclaimed rubber, Standard shoe reclaim	lb.	.16½	@	.16½
Standard tire reclaim	lb.	.20½	@	.21¼
Resin, Pontianak, refined	lb.	*.28	@	
granulated	lb.	*.25	@	
fused	lb.	*.25	@	
Rosin, K, (280 lbs.)	bbl.	6.25	@	
Rotten stone, powdered	lb.	.02½	@	.04
Rubber black	lb.	.06	@	
Rubber substitute, black	lb.	.09½	@	.14
white	lb.	.14	@	.18
brown	lb.	.14	@	.18
Rubbide	lb.	*.38	@	
Shellac, fine orange	lb.	.62	@	.65
Silex (silica)	ton	25.00	@	30.00
Soapstone, powdered	ton	16.50	@	20.00
Starch, powdered corn (carload, bbls.)	cwt.	6.08	@	
(carload, bags)	cwt.	5.95	@	
Sulphur chloride (drums)	lb.	.08½	@	.09½
Sulphur, flour, velvet brand (carloads)	cwt.	3.95	@	
Bergenport flour	cwt.	3.95	@	4.50
Talc, American	ton	16.50	@	20.00
French	ton	47.50	@	48.00
Tar, coal	bbl.	4.25	@	
Toluol, pure	gal.	1.75	@	2.00
Tripoli earth, powdered	ton	60.00	@	
bolted	ton	65.00	@	
Turpentine, pure gum spirits	gal.	.43	@	
wood	gal.	.38	@	
Venice	lb.	.10	@	
Ultramarine blue	lb.	.22	@	.50
Vermilion	lb.	*.65	@	.80
Chinese	lb.	2.50	@	
English	lb.	1.90	@	2.00
Wax, beeswax, white	lb.	.68½	@	.70
ceresin, white	lb.	.12	@	.20
carnauba	lb.	.41	@	.55
czokerite, black	lb.	.48	@	.60
green	lb.	.68	@	.70
montan	lb.	.32	@	.33
paraffin, refined 118/120 m. p. (cases)	lb.	.09½	@	
123/125 m. p. (cases)	lb.	.10	@	
128/130 m. p. (cases)	lb.	.11	@	
133/136 m. p. (cases)	lb.	.12½	@	
Whiting, Alba	cwt.	1.00	@	1.25
commercial	cwt.	1.25	@	
gilders	cwt.	1.35	@	
Paris, white, American	cwt.	1.50	@	
English cliffstone	cwt.	1.75	@	2.00
Wood pulp XXX.	ton	35.00	@	
Yellow ochre	lb.	.04	@	
india rubber	lb.	1.50	@	
Zinc oxide, American process, horsehead brand				
"XX red" f. o. b. factory	lb.	.10½	@	
"special" f. o. b. factory	lb.	.11	@	
French process, red seal f. o. b. factory	lb.	.15½	@	
green seal f. o. b. factory	lb.	.15¾	@	
white seal f. o. b. factory	lb.	.16½	@	
Zinc sulphide, pure	lb.	*.07½	@	

* Nominal prices.

THE MARKET FOR COTTON AND OTHER FABRICS.

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NEW YORK.

DURING the last week in June the apprehension of a short crop of American cotton was increased by report of drought in the producing centers and resulted in all deliveries being marked up to or above the 27-cent level. These high record figures caused considerable liquidation without materially disturbing the market, but the publication of the government's crop report on July 2, forecasting a better crop condition than was anticipated, broke the market and active selling ensued. On July 5 spot cotton was quoted 25.45 cents and October deliveries were 24.53 cents. The government figures indicate a yield of 11,633,000 bales, excluding linters, compared to 11,449,930 bales, the actual production of last season. As the month progressed, reports of beneficial showers in the South gave strength to the market and prices rallied; however, irregularity and frequent fluctuations were marked features. On July 25 spot middling cotton was 25.65 cents with October futures around 23.82 cents.

According to preliminary statistics compiled by the Bureau of Census, the amount of cotton consumed in June, 1917, was 575,122 bales, compared with 570,597 bales for the corresponding month in 1916. Cotton on hand in consuming establishments on June 30 was 1,749,738 bales against 1,835,089 bales for the same date last year, and the amount in public storage and at compresses was 1,406,821 and 1,520,370 bales, respectively.

EGYPTIAN COTTON. Nothing definite has occurred to relieve the Egyptian cotton situation occasioned by the British embargo. This season's crop has been disappointing in quantity, 120,731 bales being imported into the United States from August 1, 1916, to June 20, 1917, compared to 192,795 bales for the same period last year. The progress of the new crop which will come on the market in the next two months is not encouraging, although it is too early to forecast accurately, as the crop is made or marred in August and September. It is confidently expected that by the time the new crop is ready for shipment ample shipping arrangements will have been made, either by lifting the embargo or by the establishment of a direct service between Alexandria and this country. This question is of greatest importance to the rubber industry as it is estimated that 80 per cent of the Egyptian cotton imports is consumed by the tire trade.

SEA ISLAND COTTON. The southern markets are closed for the season as the old crop has been marketed and sold. There has been an increase in the acreage of Islands planted this year and in consequence estimates for the coming crop range from 8,000 to 10,000 bales, while the Georgia and Florida acreage has increased from 10 to 30 per cent. The crop, taken as a whole, is doing fairly well, although two or three weeks late. The appearance of boll weevil in certain sections has caused some apprehensions; the final result, however, will be dependent on weather conditions during the next two or three months and, if favorable, there is reason to expect a crop equal to that of last year.

AIRPLANE FABRICS. The market has been featured by a steady call during the past month for both No. 1 40-inch and No. 4 38½-inch balloon fabrics. The scarcity of Egyptian cotton has seriously complicated the situation, with the result that long staple American is being substituted.

HOSE AND BELTING DUCK. Government requirements are crowding the mills to full capacity, and business has been most active. There seems to be no diminution in the civilian demand, unusual at this time of the year, for mechanical fabrics, as the trade appears to be laying in stocks of manufactured goods in anticipation of future requirements.

RAINCOAT FABRICS. The local market is very active, the demand for 64-60 Bombazine being particularly heavy due to government orders, and all raincoat makers are extremely busy on war contracts. Civilian business is practically at a standstill.

SHEETINGS, DRILLS, OSNABURGS. Government business is the cause of the unprecedented activity prevailing in this market. The civilian call for all grades continues unabated, a most unusual condition for the summer season. The fabric mills show no signs of slowing down and are well sold up into March of next year.

TIRE FABRICS. The tire fabric market is dominated by the Egyptian cotton situation occasioned by the embargo. If sufficient supply of the raw material is permitted to reach this country within the next two months, the trade will not suffer. Meanwhile, consumers are quietly experimenting with long staple American grades as possible substitutes should the usual supply of Egyptian cotton be unavailable.

The anticipation that the government would require a large part of the capacity of the tire fabric mills has not been realized. It was found inexpedient and too costly to operate tire fabric looms on the coarse product required by the government. In the absence of government business the tire fabric market has been quiet and a perceptible easiness in deliveries noticed during the past month. Prices have been generally firm and

standard Egyptian building fabric, combed and carded, has advanced since our last report, due to the strong position of the raw material.

NEW YORK QUOTATIONS.

JULY 26, 1917.

Prices subject to change without notice.

Airplane and Balloon Fabrics:			
Wamsutta, S. A. I. L. No. 1, 40-inch	*yard*	$0.57	@
No. 4, 38½-inch		.50	@
Wool Stockinettes—52-inch:			
A—14-ounce	*yard*	1.75	@
B—14-ounce		2.25	@
C—14-ounce		2.50	@
Cotton Stockinettes—52-inch:			
D—14-ounce	*yard*	.85	@ .90
E—11½-ounce		.60	@ .65
F—14-ounce		.85	@ .90
G— 8-ounce		.75	@ .80
H—11-ounce		.70	@ .85
I — 9-ounce		.60	@ .65
Colors—white, black, blue, brown.			
Knitabac Stockinette	*pound*	1.60	@ 1.65
Tire Fabrics:			
17¼-ounce Sea Island, combed	*square yard*	1.60	@ 1.65
17¼-ounce Egyptian, combed		1.40	@ 1.45
17¼-ounce Egyptian, carded		1.35	@ 1.40
17¼-ounce Peelers, combed		1.10	@ 1.15
17¼-ounce Peelers, carded		.85	@ .90
Sheeting:			
40-inch 2.35-yard	*yard*	*.17	@ .17½
40-inch 2.50-yard		*.17	@ .17½
40-inch 2.70-yard		*.17	@ .17½
40-inch 2.85-yard		*.17	@ .17½
40-inch 3.15-yard		*.17	@ .17½
Osnaburgs:			
40-inch 2.25-yard	*yard*	.18	@
40-inch 2.48-yard		.17	@
37½-in. 2.42-yard		.17½	@
Mechanical Ducks:			
Hose	*pound*	.53	@
Belting		.53	@
Carriage Cloth Duck:			
38-inch 2.00-yard enameling duck	*yard*	.27½	@
38-inch 1.74-yard		.31	@
72-inch 16.66-ounce		.54	@
72-inch 17.21-ounce		.55	@
Drills:			
38-inch 2.00-yard	*yard*	.25	@
40-inch 2.47-yard		.20¼	@
52-inch 1.90-yard		.26½	@
52-inch 1.95-yard		.26	@
60-inch 1.52-yard		.34¼	@
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:			
63-in., 3¼ to 7½ ounces	*yard*	*.38	@ 1.55
36-inch, 2¾ to 5 ounces		*.35	@ .85
Imported Plaid Lining (Union and Cotton):			
63-inch, 2 to 4 ounces	*yard*	*.35	@ .75
36-inch, 2 to 4 ounces		*.25	@ .50
Domestic Worsted Fabrics:			
36-inch, 4½ to 8 ounces	*yard*	.35	@ .65
Domestic Woven Plain Linings (Cotton):			
36-inch, 3¼ to 5 ounces	*yard*	.10	@ .18
Raincoat Cloth (Cotton):			
Bombazine 64 x 60 water repellent	*yard*	.15½	@
60 x 48 not water repellent		.11½	@
Twills 64 x 72		.16½	@ .17
64 x 102		.22½	@ .25
Tweed		.25	@ .30
Tweed, printed		.10	@ .15
Plaids 60 x 48		.12½	@
56 x 44		.12¼	@
Surface prints 60 x 48		.13¼	@
64 x 60		.15	@
Repp		.19	@ .23½
Burlaps:			
32—7½-ounce	*100 yards*	9.00	@
40—7½-ounce		10.10	@
40—8-ounce		10.25	@
40—10-ounce		13.50	@
40—10½-ounce		13.75	@
45— 7½-ounce		*12.50	@
45— 8-ounce		*12.40	@12.60
45— 9½-ounce		*15.15	@15.25
48—10-ounce		*16.75	@

* Nominal prices.

EGYPTIAN COTTON MOVEMENT.

FROM AUGUST 1, 1916, TO JUNE 20, 1917.

To—		1916-17.	1915-16.	1914-15.
Liverpool	*bales*	201,764	206,579	199,135
Manchester		128,497	133,969	145,600
Total shipments to Great Britain		330,261	340,548	344,735
To—				
France	27,735	38,056	59,818	48,856
Spain	10,321			
Italy	29,807	49,695	48,481	167,842
Switzerland	19,888			
Russia		31,686	42,310	39,605
Greece		65	775	2,392
Total shipments to Continent		119,502	151,384	258,895
To—				
United States		120,731	192,795	157,646
India	100	11,005	25,065	15,806
Japan	10,905			
Total shipments to all parts		581,499	709,792	776,882
Total crop (interior gross weight), *cantars**		.....	4,726,518	6,473,726

* A cantar equals 98 pounds.
(*Compiled by Davies, Benachi & Co., Liverpool.*)

TIRE
FABRICS

JENCKES
SPINNING
COMPANY

PAWTUCKET
RHODE ISLAND

The Canadian Consolidated Rubber Co., Limited, has opened a branch in Lethbridge, Alberta, situated on the main line of the Canadian Pacific Railway. The new branch is housed in a modern, three-story brick block, 40 by 90 feet, equipped with elevator service. A. Parks is the manager.

INDIA RUBBER WORLD
FOUNDED 1889
CAOUTCHOUC GUTTA-PERCHA

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